

# *Model of management of processes and phenomena's in the military security system*

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**Abstract.** This paper presents theoretical analyzes and assessments of governance models in the military security system in the context of dynamically changing national security. The model for managing processes and phenomena in the system has been studied.

**Keywords:** *military security, processes, security policy*

## I INTRODUCTION

Considering national security as a complex public system with the force of imperative requires the perception of processes and phenomena in the military security system that make it unity, integrity, interconnectedness, and contradiction. The main processes of strategic security management directly correspond to different aspects of the environment of any nature, characterized by dynamism, unpredictability, and uncertainty [1].

The complex and complicated concept of military security „defines a problem with too broad a range that allows different interpretations depending on the interests of the participants themselves in the discussion [2].

Analysts' expectations that the information technology era will reduce the complexity and confusion of the battlefield are far from being met. Thus, in modern threat scenarios, the pursuit of technological superiority has proved to be an insufficient condition for success in network-centric wars. The human factor has once again been placed on the entire chain of command as an opportunity to deal with the growing amount of information and the need for timely decisions [3].”

## II MATERIALS AND METHODS

This research delves into an in-depth analysis of the challenges to national security in light of the evolving risks

and threats that have arisen in the current security landscape. The study aims to provide comprehensive insights into the implications of these changes and their potential impact on the security environment. It is crucial for us to prioritize the establishment and execution of a novel security and defense policy that is rooted in scientific principles. This policy should encompass all facets of military security and must be complemented by effective implementation strategies that ensure its success.

## III RESULTS AND DISCUSSION

In 2018, the external environment of security retained its complex and dynamic character, caused by changes in the equilibrium of forces in geopolitical, economic, and military terms. In the year, national interests and the fight for supremacy prevailed on a global and regional level. Variable international relations predetermined the main threats and risks for the national security and the interests of the Republic of Bulgaria. There have also been attempts to have a hybrid impact on a country, including action to influence in various aspects - political, economic, diplomatic, cultural, and propaganda. The unstable crisis processes in the Balkans, the Middle East and North Africa, Central and Southeast Asia are a major source of instability, political, economic, and asymmetric threats and risks for the country. The rapid development of technology for the production of weapons of mass destruction, as well as North Korea's aggressive foreign policy, continues to be a serious challenge to the international community.

Europe's tendency to be the desired destination for legal and illegal migration from North Africa, the Sahel, the Middle East, Central, and Southeast Asia is preserved. A Migration Agreement between the Turks and the EU was concluded in 2016, and despite its implementation, the potential threat to our country's security was maintained. The

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illegal crossing of the state border on the road to Europe continues to pose a threat to national security. There is a risk of penetration or transit of radicalized entities across the territory, as well as the involvement of organized crime groups in this traffic. Consequently, the challenges to the national security policy arising from the dynamics of changes in existing threats and risks in the new security environment require the formulation and implementation of a new science-based security and defense policy, military security, and strategies for their implementation.

The field of military security is vast and complex, encompassing a range of processes and phenomena that require careful examination and analysis. To ensure the safety and security of a nation, it is essential to identify and understand the sources of threats, as well as the defensive institutions that are specialized in managing those threats and mitigating the associated risks. Ultimately, military security is a critical domain that falls squarely within the purview of the state, demanding a high degree of competence, responsibility, and commitment.

#### IV TYPES OF MILITARY SECURITY SYSTEM CONTROLS

This means that intensive and in-depth analyzes of dynamics in changing the modern security environment, the needs and interests of civil society, security policy reform, and new security sector legislation, set up conditions for the conduct of Strategic Management. Because of this modern managers face the need to continually develop their skills [4].

Different researchers reveal separate and common states of military security. For example, in one of his analyzes, Nikolay Iliev directs himself to reveal the elements and factors influencing the planning process and the formation of the armed forces. The establishment of the respective troop organization includes activities on the scientific justification of the necessary organizational structure, machines, armaments, and training; equipment, personnel; setting up a training, training and military service system; establishment and operation of a management and military administration subsystem; establishment and operation of a mobilization subsystem; creation, maintenance, and development of a military command subsystem in the course of military and non-military actions in national and coalitions, etc. [5].

Given the current landscape of threats and risks, it is important to evaluate whether the system of security, particularly in the context of military security, is functioning effectively and in a state of equilibrium.

Human understanding of the world is constantly evolving despite the vast amount of knowledge we have. The discoveries made through new research often raise new

questions and unresolved issues, requiring new explanations and theories to be developed. In this sense, physics is in a continuous process of development and is still far from being able to explain all natural phenomena and processes [6]. The interplay between economic growth and sustainable development is a recurring theme, with discussions centering around the potential effects...[7].

The answer can be found in the 8<sup>th</sup>-grade physics textbook, which states that „Equilibrium is a state of a system, in which the equivalence of all external forces acting on each point of the system is zero. There are three types of balance in mechanics - steady, unsustainable, and indifferent. „When the force of gravity is balanced by the response force of the support, the kind of balance can be determined by the position of the center of gravity.

The answer may be in the Toricelles rule: If the center of gravity occupies the lowest position compared to all possible adjacent positions, then the balance is steady.

Here we find the place of physics that explores and describes physical objects and systems [8]. The task of managing theory is to transform the management style with the help of controlling influences to form a prescribed behavior.

When it comes to ensuring military security, the implementation of process and phenomenon management theory is crucial. However, this can only be achieved effectively by applying system management theory. In summary, properly managing processes and phenomena within the military security system requires a well-structured and systematic approach. To effectively manage military security systems, it is crucial to have a solid understanding of the various models of management objects, management objectives, and management algorithms. Additionally, it is important to clearly understand the basic methods involved in creating effective algorithms for managing these systems and the results that can be achieved. However, given the complexity and scope of this subject, When dealing with complex problems, it can often be quite difficult to comprehensively address and account for all of the pertinent issues and factors involved. Indeed, such situations frequently require a great deal of careful analysis, consideration, and thoughtfulness to arrive at an effective and well-rounded solution or approach.

According to the most popular management definitions, it is the organization and coordination of activities following certain policies to achieve clearly defined goals and a set of authority powers and decision-making responsibilities. As a discipline and practice, management is the process of planning, forecasting, organizing, managing, coordinating, controlling, and regulating all the elements and resources of the organization [9].

In all types of management, a level of uncertainty exists. In each situation, all or most of the factors creating uncertainty act to varying degrees. For this reason, each decision made at a given time will lead to a different result [10]. The type of management chosen for the military security system has to provide reliable and robust decision-making on all levels.

The control theory works with three types of controls: parameters are constant functions of time, parameters are variable functions of time and parameters are a combination of the first two. They use state variables that control variable and output (observable) variables.

**In the first type of control** – In a system, the control or control parameters are functions that remain constant over time. These parameters play a critical role in optimization tasks as they help in finding the optimal value of a control parameter that can provide a minimum or maximum value of a set function of the system. However, it is important to note that setting a definite value in value over time may not always produce the desired effect as it could affect the system's modes of operation. Hence, careful consideration and analysis of the control parameters are crucial for ensuring optimal system performance.

**In the second type of control** – The concept of control parameters as variable time functions is integral to the study of the behavior and properties of systems and materials in uncertain or hesitant actions, where the effects are harmonious. One key aspect of such systems is their ability to be managed and controlled, which is a function of time. Depending on whether the control influence depends solely on time or other factors as well, the mode of control can be either programmatically or interference/open-loop control. This nuanced understanding of control theory is essential for designing and implementing effective control systems in a wide range of domains, from engineering to biology. Programming may depend on parameters as well as on the initial conditions of the control object:

$$u(t)=U(t,x_0) \quad (1)$$

The third type of management, parameter management is a combination of the first two in the form of  $u(t) = const$  or  $u = u(t)$  defining the simplest forms of management. Even greater capability is the controlling influence that is used to calculate the results of  $u(t)$  a site's measurement or outputs. Such control is recorded in a status feedback form:

$$u(t)=U(x(t)) \quad (2)$$

or at exit:

$$u(t)=U(y(t)) \quad (3)$$

where “x” and “y” are the vectors of the state and outputs of the system.

Feedback management has significantly more capabilities and allows the system properties to be substantially changed. However, this may sometimes result in negative results from such methods, such as influencing the measurement, changing the system of equations describing the system, and therefore testing another system. In physical tasks, the impact is subject to strict limitations - requirements for small values of management [11] [12].

The study suggests that every impact experiment on the military security system brings about some changes, even without feedback. Even a simple observation of the system could distort its natural course, which follows the principles of quantum mechanics. However, despite this, conducting experiments is still a useful means of studying the system.

In the military security system, it is assumed that phenomena and measurement processes do not impact the dynamics of the site and can be disregarded. However, this assumption does not hold for microsystems and objects, as these may be affected by even the smallest changes in their environment or measurement processes. Therefore, it is essential to consider these factors when dealing with microsystems and objects to ensure their proper functioning and security.

Both in physics and in the military security system, it is manageable if:

- it has a separate parameter and/or parameters called input or control, the change of which leads to changes in some behavioral characteristics of the system called outputs;
- it has a separate parameter and/or parameters called input or control, the change of which leads to changes in some behavioral characteristics of the system called outputs;[13]
- the area of the behavior of the system, the parameter at the control capability limits, which corresponds to the desired modes of operation of the system.

#### V MODELS OF MILITARY SECURITY MANAGEMENT OBJECTS

In the realm of physics, a wide range of phenomena can be described using differential equations. However, some of these equations are private and cannot be easily studied. For this particular investigation, only ordinary differential equations will be used. These equations are known for their simplicity and ease of analysis, making them a popular choice for many scientific studies. The patterns of

management objects described with them in the state space are represented by:

$$\dot{x}=F(x,u) \quad (4)$$

where  $x=x(t)$  is the n-meter vector of component state variables  $x_1, x_2, \dots, x_n$ , and the components of the control effects are  $u_1, u_2, \dots, u_m$  also  $u = u(t)$  is a m-vector vector at the inputs of the control variables. The system of ordinary differential equations is:

$$\frac{dx_i}{dt} = F_i(x_1, x_2, \dots, x_n, u_1, u_2, \dots, u_m), \quad i=1, 2, \dots, n \quad (5)$$

$\frac{dx_i}{dt}$

$F(x,u)$  must satisfy the conditions for the existence and uniqueness of the decision with initial conditions  $x(0)$ .

When the input variables are dimensions like forces, moments, intensity, etc., objects are coordinated. If the input variables represent a change in the system parameter values, the objects are parametric control. For example,  $u(t)=p-p_0$ , where  $p_0$  is the initial value of the parameter. Input variables can also be represented here by the relative change in system parameter values. Then  $u(t)=p/p_0$  is a dimensionless dimension.

The Model of Controls in the Military Security System is convenient for describing the management of the dynamics of objects with discrete models.

$$x_{k+1} = \bar{F}_k(x_k, u_k), \quad y_k = h(x_k) \quad (6)$$

where  $x_k, u_k, y_k$ , state vectors, inputs and outputs of the process step  $k=0, 1, 2, \dots$ , the discrete model is set with a set of  $\bar{F}_k$ . Switching to a discrete model is convenient, even for continuous processes, as the measurement takes place at discrete times. Then:

$$x_k = x(t_k), \quad u_k = u(t_k), \quad y_k = y(t_k) \quad (7)$$

We can conclude that the model of military security consists of common instruments and commitment to security, freedom, and the inviolability of human life, which leads to their mutual reinforcement.

## VI CONCLUSIONS

It is necessary to counteract the causes of insecurity, to improve prevention, and to anticipate action [14]. To ensure the safety and protection of citizens, it is important to involve all relevant sectors, including the political, economic, and social sectors, as appropriate. Additionally, there should be a greater emphasis on the interdependence between internal and external security measures. By working together across sectors and focusing on interdependence, we can create a

more comprehensive and effective approach to safeguarding individuals and communities.

As a means to ensure the military security of nations, it is feasible to establish stronger partnerships with existing international security organizations. It is important to note that while achieving some short-term goals without actively engaging with various organizations may be possible, it is imperative to do so in the long term for a country to achieve strategic success. Building and maintaining relationships with these organizations can provide valuable insights and resources that can lead to sustainable growth and success. Therefore, countries should prioritize actively engaging with relevant organizations to ensure long-term success.

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