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RESEARCH ARTICLE

GLOBAL CYBER SUBSYSTEMS IN THE FOOD SECURITY DOCTRINE

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Abstract

In the sense of the systemic approach, the article examines the subsystems of cybersecurity in the context of food security. The international situation in the conditions of regional conflicts affecting the foundation of food chains at the regional, national, supranational and global levels requires careful scientific research and the creation of fundamentally new concepts combined with action plans and related to the digitalization of the food security system. It is in this vector of development that the problems and conflict points under consideration ensure the construction of a current and timely, modern, efficient, effective, consistent with the geoeconomic and geopolitical situation, a model for action and a future reaction in the increasingly fragmented external and internal food environment. Such an approach will make it possible to avoid the focus on accidents and concentrate efforts within the framework of determinism, affecting the cause-effect relationships of social phenomena. The crises of the modern food system, especially of global food chains, constitute an existential holistic rethinking of the dynamics of the digital food situation, resulting in an extraordinary acceleration of time, expressed in a significant, unprecedented acceleration of historical, social, digital food and other processes.

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Introduction:-

The modern transformation of food relations actively progressing towards the digitalization of the system shows the need to consider the movement of these processes in a complex dependence, expressed in the convergence of the two interconnected systems - food and digital. Against the background of the emerging social contradictions associated with the transition to a completely new type of interaction in every sphere of public relations, the cyber environment directly affects the regulation of global food chains, even in those countries and supranational associations pursuing a policy of food autarky. The Middle East conflict between Iran on the one hand and the United States of America and Israel on the other clearly showed how the emergence of a crisis affecting one of the main energy food elements such as oil increases the progression of problems and crises along the entire food and economic chain. The emphasis is on the negative impact that an armed conflict has on the country or territory in which it develops, as well as on the actions taken by intergovernmental organizations and state authorities to alleviate the suffering of the local population (Dimitrov, 2025). Even state leaders seeking to increase their food self-sufficiency, such as China, were also affected, which leads to the conclusion that it is impossible to limit the

fundamental new concept of shared responsibility within the framework of shared security. All states and supranational associations should promptly direct their efforts to a common contribution within the framework of global security, to a conceptually correct regulation of international relations in the context of digital realities implemented in food relations

Methods:-

According to the scientific title of the study, it is appropriate to use a systemic approach combined with a theoretical deductive method - a transition from considering the general to the particular, from the system as a whole to its individual subsystems and elements, reaching scientific awareness as a form of information and communication interaction. Due to the tendency towards acceleration, especially of the digital system, and its implementation in the food system, it is necessary to use observation and description of the processes that have arisen and are underway, for the purpose of accurate analysis and a set of sequences for future events in the studied areas.

Philosophical or fundamental methodology is the highest form of methodological science, which determines the general strategy of the principles of knowledge, affecting the peculiarities of phenomena and processes. In this study, it is applied for the purpose of a comprehensive consideration of global digital food processes, specifically implementing the dialectical method as a fundamental scientific principle encompassing multi-layered processes and their differentiation and integration into objective reality. The analytical method was also used in one of its subtypes - cause-and-effect analysis - to clarify the causes of the problem and understand the relationship between cyber subsystems and food security.

Results:-

Modern food security as a fundamental element of national security collides with other subsystems ensuring the functioning of the sustainable development of society. In the information society, holistically growing in all spheres of public life, in the conditions of escalating geopolitical military-political confrontation in hot spots, going far beyond diplomatic relations, security, but individual critical sectors need increasingly effective and timely protection in cyberspace. The specifics of real politics and the abstraction of "soft power" place the newly formed world order in conditions of multifacetedness and only the most adaptive states, formal or informal military, political and economic alliances will ensure their future comprehensive security, part of which is food security. The leading Western European countries of the European Union pose enormous challenges to the food and political security of all European countries, including the Republic of Bulgaria, through elites that do not respond to modern challenges and show extreme short-sightedness in terms of short-term geopolitical prospects. In such dynamic conditions, a strategy is needed at different levels in the doctrine of food security, its cyber security and cyber protection.

The doctrine of food security is a complex of measures related to a system of views and management tasks in the field of organizing food activities, in the context of the transformation of the framework of the international security system. The absence of a doctrine on food security in the Republic of Bulgaria after 1989 places the country in a complex situation and faces the need for adequate and timely solutions to the food crises that are worsening in more and more regions of the world and the possibility of new ones even on the territory of the European continent. In order to avoid the so-called "sociology of inequalities" developed by the German philosopher Georg Simmel, generally coordinated and shared actions by all participants in the food chains are needed, which are more easily feasible in the digital age. The growing process of informatization in public and community information resources necessitates the formation of cyber protection of confidential information in the food security system. Cybersecurity as a paradigm and discipline is developing and entering the ever-growing need of food science for information systems, timely and economically sound expansion and application of discoveries. The protection of biological data and information in food security differs from traditional approaches in biosecurity. Cyberbiosecurity is a discipline that developed at the convergence of biological security, cybersecurity and cyber-physical security (Cherdantseva et al., 2016).

In current geopolitical and geoeconomic relations, food security is an integral part of the national security strategies of the leading countries - China, the USA and Russia, as well as the so-called regional countries - India, Turkey, Saudi Arabia and others. Very often, the component part of the national security strategy contains food elements, which are further set out in the food security doctrine. The much broader application of this term, especially in real politics, implies going beyond the concept of "food security" and using the far more comprehensive concept of "provide security". This is fundamentally important because it includes not only food security, but also health security, water security, energy security, security of supply, individual and public security, food self-sufficiency as

an archetypal concept in the modern conditions of global competition. In a large part of the scientific literature, the relationship between food security and national security is found through cause-and-effect relationships of the functioning of economic and social security, which are direct components of national security. Other authors try to classify all the main types of security – national, economic-social, demographic, informational, food, defense, political, ecological, spiritual-moral and technogenic (Yarkova, 2019:7-8). Attempts at such a classification always remain incomplete, but the expansion of the concept of “Food security” is mandatory for its full holistic study in the modern scientific literary environment, as well as the introduction of the axiometric concept of “provide security”. The policy of the European Union clearly shows that in the future one of the leading agencies in the supranational union will be in the field of food security.

The technogenic components of the protection of the food security system lead to the need to consider the subsystems of cybersecurity in the food system – provide system. The functioning of modern food systems in a digital environment depends on the security and resilience of the identity and access management (IAM) subsystem. In this way, an opportunity is provided for the sustainable development of food chains, based on the possibility of fully authorized, legally regulated and expedient access with the task of general objective and comprehensive control over it. An important component of the subsystem is identity and access management based on temporary access privileges, enabling the implementation of regional, national, supranational, and global food security projects of a temporary nature. The zero-tolerance approach implements a concept of the absence of complete trust in the access of each user, and instead a system of pre-prepared procedures is implemented when attempting to access a given resource. The genesis of the implementation of the principles of this subsystem is generated in the etymology of the general concept of security - ontologically understood as an irrevocable paradigm for the sustainable development of a higher system of the functioning of society. From this perspective, we can talk about a unified cyber-food system, the implementation of which is becoming increasingly relevant.

Conclusion:-

The continuous and irreversible process of reformatting a large part of the global food system in the cyber environment necessitates the study of the interweaving of these components of security in a mandatory collision, with the aim of pragmatic and contemporary control of the processes to achieve the generally defined and generally accepted principles of food security - the sustainability of the system in conditions of crises and the appropriate distribution of resources at all levels for the purpose of stable functioning of the highest system - the social one.

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