O P I N I O N

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Professor at department “National security and political studies” within Faculty of Philosophy of St. Cyril and St. Methodius University of Veliko Tarnovo

For a dissertation work with author:

Kostadin Rangelov Bakov

WITH A TOPIC: CYBERBIOSECURITY AS AN ELEMENT OF THE NATIONAL SECURITY SYSTEM

Presented for acquiring educational and scientific degree "Doctor"
In the field of higher education 9 “Security and defense” within professional field 9.1 "National security”,
doctoral programme „National security”

1. General presentation of the procedure and the doctoral student

In 1999, the doctoral student acquired the "Master's" degree in "Finance and Banking" at the "D.A. Tsenov" Economic Academy - SVISHTOV. He has extensive professional experience in the security system of the Republic of Bulgaria, having held a number of responsible positions in the Ministry of Internal Affairs. During his service, he systematically improved his qualifications in courses at the US Department of Treasury, the International Human Rights Academy "ILEA" Budapest - HUNGARY, the Headquarters of the "SECRET SERVICE" - Washington - USA, etc. He is currently an assistant at the "Paisiy Hilendarski" University, FISN, Department of "Political Science and National Security".

By order RD - 21-1531/19.07.2023. of the Rector of Plovdiv University, Assistant Professor Kostadin Bakov was enrolled as a doctoral student in independent training at the Department of "Political Science and National Security". From the submitted opinion of the scientific supervisors, it is clear that the doctoral student has successfully completed the curriculum and submitted the dissertation within the specified deadline. A preliminary discussion of the dissertation was held before an extended departmental council and with Protocol No. 128/27.06.2025 of the Department of "Political Science and National Security" and Order of the Rector RD- 22-1119/14.05.2025, the doctoral student was enrolled with the right to defense, and the dissertation was sent to a scientific jury. From the submitted report, it is clear that Assistant Professor K. Bakov has fulfilled the national minimum requirements for acquiring the ONS "doctor".

In conclusion, it can be said that the procedure for defending the dissertation was carried out without any violations, in accordance with the requirements of the Act on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its implementation.

2. Relevance of the topic

The National Cybersecurity Strategy "Cyber-Resilient Bulgaria 2020", adopted by Decision of the Council of Ministers No. 583 of July 18, 2016, is a strategic framework for the cybersecurity policy implemented in the Republic of Bulgaria, which considers the cybersecurity system as part of the national security protection system. The National Assembly also voted on the "Cybersecurity Law", in which cybersecurity is defined as a state of society and the state, in which, through the implementation of a complex of measures and actions, cyberspace is protected from threats related to its independent networks and information infrastructure or that may disrupt their operation.

With each passing day, technologies are becoming more complex, and computer breaches and attacks are becoming more frequent and bolder. Governments, organizations and businesses around the world are faced with various cyberattacks every day, in which attempts are made to illegally gain access to sensitive information. Technological progress is also revolutionizing the life sciences, unlocking new opportunities in personalized medicine and public health management. These same technologies carry serious dual-use risks, especially in the context of the development of biological weapons. The COVID-19 pandemic has demonstrated the vulnerability of the world's systems for dealing with biological threats, which highlights the need for adequate biosecurity measures. It has become clear that no country is fully prepared for a large-scale biological crisis caused by natural or deliberate biological threats, which has highlighted the lack of effective biosecurity strategies.

Cyberbiosecurity is an emerging field at the intersection of cybersecurity and biosecurity. Its most general goal is to counter the potential or actual malicious destruction, misuse or use of valuable information, processes and materials at the interface of life sciences and "digital worlds", which defines it as part of the system of measures to protect the bioeconomy, personal and public health.

The relevance of the topic of biosecurity and cyberbiosecurity is caused by the growing trend of terrorist attacks using biological weapons and, last but not least, the significant scientific achievements in the field of molecular biology and molecular biotechnology, which have led to the possibility of almost unhindered use of molecular biological techniques and methods in routine laboratories. At present, there is no doctrine, concept and programs for cyberbiosecurity at the national level, which is the main direction for focusing the academic efforts of the doctoral student.

3. Knowledge of the problem

Considering the extensive practical experience and expertise of the doctoral student, I express the opinion that he has penetrated the details of the scientific matter under consideration, which allows him to identify and analyze the research problems, propose and evaluate possible solutions, make sense of the achieved results and systematize appropriate proposals.

4. Research methodology

The selected research methodology in the development of the dissertation is based on the systematic approach, and various general scientific methods were used to solve the individual research tasks - factor analysis, synthesis, comparison, summary, etc.

In the process of conducting the study, the author followed the main stages in the preparation of an online questionnaire using the LimeSurvey platform, as a method for collecting information. The purpose and the upcoming procedure for collecting research data were rationally explained in advance. Also, the participants are familiar with the essence, working concepts and definitions of the upcoming study. The survey conducted with young experts and specialists from the structures for countering threats in the field of cybersecurity and biosecurity

on issues related to the awareness and training of specialists is a serious basis for achieving reliable scientific results for practice.

5. Characteristics and assessment of the dissertation work and contributions

The content of the scientific work is presented in an introduction, an exposition in six chapters, a conclusion, literature and appendices with a total volume of 221 pages. In the process of developing the dissertation work, the author correctly used 195 literary sources, of which 35 in Cyrillic and 160 in Latin. Considering the specificity of the topic of the dissertation work, the volume and diversity of the information sources used shows comprehensiveness in the preparation and implementation of the scientific research process and an effort to summarize previous scientific opinions. I am not aware of any results of the research in the dissertation work being cited by other authors.

As a result of the development of the dissertation work, I accept as the research results of the doctoral student:

1. A model has been proposed for combining the requirements and standards for ensuring physical security with those for cybersecurity and biosecurity when implementing control for assessing the level of protection in institutions and companies working with sensitive data.

2. An interdisciplinary approach has been developed to upgrade the activities for ensuring cyberbiosecurity in the sensitive personal data vector in the areas of: processing large data sets with sensitive information; regulation for storage and access to sensitive large databases.

3. An approach has been proposed for developing a protocol of activities to ensure the necessary cyberbiosecurity in the collection, storage, processing and provision to various legal entities of sensitive personal data related to the health status of citizens.

6. Assessment of the publications and personal contribution of the doctoral student

On the topic of the dissertation work, the doctoral student has presented three authored publications. They have the nature of scientific reports, directly correspond to the topic of the dissertation and are announced at authoritative scientific forums. The scientific and applied scientific contributions are the personal work of the doctoral student, which have been achieved through his theoretical and practical research and are a successful attempt to study key issues accompanying the development of an integrated approach to cyberbiosecurity as an integral component of national security.

7. Abstract

The abstract is developed in accordance with the requirements and contains the main problems and the ways to solve them specified in the dissertation work and gives a complete idea of the scientific value and practical applicability of the achieved contributions.

8. Recommendations for future use of the dissertation contributions and results

The statements developed in the dissertation work are applicable:

- to support the process of developing regulations for the implementation of cyberbiosecurity requirements in organizations;
- in the preparation of protocols for conducting activities in response to cyberbioattacks;
- in the investigation of cyberbiocrimes;
- in the educational process of specialized higher schools and qualification courses.

CONCLUSION

The dissertation is a thorough and complete scientific work from the study of a current problem and has achieved significant scientific and applied contributions, proving the ability of the doctoral student to independently develop issues important for theory and practice. From the analysis of the work, it is concluded that the dissertation work has scientific and applied contributions and complies with the Act on the Development of the Academic Staff in the Republic of Bulgaria and the regulations for its implementation, and I propose to the scientific jury to award Kostadin Rangelov Bakov ONS "doctor" in the field of higher education 9. Security and Defense, professional field 9.1. National Security, under the doctoral program "National Security" for the developed work on the topic "CYBERBIO SECURITY AS AN ELEMENT OF THE NATIONAL SECURITY SYSTEM".

Prepared the opinion:

July 28 2025 Professor eng. PhD /Georgi Kamarashev/