REVIEW

By professor Georgi Vasilev Bahchevanov, DSc

regarding the dissertation thesis for the award of the higher academic degree of

"Doctor of Sciences"

in Professional Field: 9.1. "National Security"

Author of the dissertation thesis: Dr. Teodora Kirilova Licheva

Dissertation Topic: "Transformation of the Management Cycle in Intelligence and Counterintelligence through the Integration of Modern Technological Solutions"

1. Relevance and Significance of the Research Problem

The reviewed dissertation thesis offers a contemporary, conceptually grounded, and theoretically proven solution to a fundamental scientific problem. The research is positioned within the context of the transformational processes affecting the traditional intelligence/management cycle in intelligence and counterintelligence under the influence of the technological paradigms of "Industry/Security 4.0, 5.0, and 6.0."

The relevance of the topic is indisputable and stems from dynamic technological progress, which generates qualitatively new, asymmetric, and unprecedented challenges to the national security architecture. The author masterfully substantiates the objective necessity for security agencies to undergo a radical transition from reactive modes of operation to proactive, predictive, and strictly data-driven models of strategic leadership.

The scientific and applied significance of this work is highlighted by its pioneering and innovative nature. To date, Bulgarian specialized literature has lacked such a comprehensive, systematic, and in-depth study that meticulously deconstructs and analyzes the impact of the contemporary technological spectrum

on the management cycle and its specific phases within intelligence and counterintelligence processes. The study examines the impact of a wide array of advanced technologies, including Big Data, Artificial Intelligence (AI), Cloud, Edge, and Confidential computing, Blockchain technologies, the "Zero Trust" concept, Unmanned Aerial Vehicles (drones), additive technologies, nanotechnologies, geotechnologies, Virtual (VR) and Augmented (AR) reality, Digital Twins, and space technologies.

The assessment of the state of the problem and the proposed solutions are presented precisely and accurately as of the time of the defense. There is total alignment between the title of the dissertation and its substantive core.

The methodological framework of the research is structured with exceptional precision. It is situated at the interdisciplinary intersection of management theory, national security, and modern information and communication systems. The selected toolkit is properly chosen to achieve the defined goals and objectives, and it includes: **Systemic and structural-functional approaches** – to investigate security as a complex, multi-layered, and dynamic system; **Management analysis** – utilizing a matrix structure based on elements of the management cycle and corresponding levels of administration; **Historical and comparative methods** – through a critical analysis of the best practices of leading global intelligence communities in comparison with the security architecture of the Republic of Bulgaria; **Scenario and forecasting analysis** – with a conceptual horizon for strategic planning up to 2030; **Documentary and legal-analytical methods** – for a precise evaluation of the relevant regulatory frameworks at both national and international levels.

Overall, the methodology ensures a high degree of credibility for the obtained results and conclusively proves the primary research thesis.

2. General Description and Structure of the Dissertation Thesis

The reviewed dissertation thesis possesses an impressive volume of 425 pages and is characterized by a balanced, logical, and classic academic architecture. Structurally, the study is expanded into an introduction, three independent chapters, a conclusion, a list of scientific contributions, and a bibliography.

The high scientific and applied value of the work, along with its analytical depth, is reinforced by extensive illustrative material, including 94 figures and 34 tables, which visually systemize complex technological and managerial dependencies. The exceptionally large reference apparatus is highly impressive – the list of utilized sources contains over 520 titles and internet links in Bulgarian and foreign languages, demonstrating the author's excellent familiarity with the subject matter and rigorous theoretical training.

All goals and objectives formulated in the introduction are in full logical alignment with the topic of the dissertation. They are precisely deconstructed and sequentially resolved throughout the exposition of the individual chapters.

A particular merit of the work is that the author completely and correctly formulates the limitations of the study. These encompass regulatory restrictions when handling classified information, the specific geographic scope, and the defined timeframe (up to 2025). This explicit delineation of the research field serves as clear evidence of academic honesty, high scientific maturity, and the doctoral candidate's ability to precisely position large-scale research projects methodologically.

3. Characteristics of the Scientific and Applied Contributions in the Dissertation Thesis. Credibility of the Material

The reviewed dissertation thesis possesses indisputable, original scientific and applied contributions that fully comply with the rigorous criteria for awarding the academic degree of "Doctor of Sciences."

The core of the primary contribution of this dissertation lies in the theoretical formulation and conceptual modeling of the *migration of the intelligence cycle elements* specific to security agencies. The author successfully argues for the transition from traditional, conventional, and analog forms to modern, digital processes. This model precisely integrates the specific features of individual levels of management based on the time horizon and hierarchical structural levels within the national security architecture.

The contributions presented by the candidate can be categorized as follows:

I. Theoretical-Scientific Contributions

1. **Conceptualization of digital security management:** A comprehensive, scientifically substantiated concept for the digital management of security has been formulated. It defines the paradigmatic shift from a classic reactive model to a proactive, predictive, and sustainability-oriented management model operating on the basis of big data and cutting-edge technologies.
2. **Development of an interdisciplinary integration model:** An innovative, interdisciplinary model for technological integration in security management has been created. It successfully synthesizes managerial, legal, historical, ethical, and technological dimensions, subjecting every technological innovation to critical analysis through the prism of the entire intelligence cycle.
3. **Formalization of matrix models and operational templates:** Matrix models and conceptual templates for the targeted application of a wide range of key technologies (Big Data, AI, cloud architectures, blockchain, unmanned systems, nano- and geotechnologies, VR/AR, digital twins, Zero Trust platforms, space technologies, etc.) have been derived and methodologically formalized. These models are broken down by elements of the management cycle and tailored specifically for intelligence and counterintelligence operations.
4. **A fresh perspective on the institutional evolution of Bulgarian security services:** An original, deeply refined historical-institutional analysis of the

development of the Bulgarian intelligence community is proposed. Specific historical stages, structural transformations, and technological modernization processes are outlined, and deficiencies in the sector are critically compared with leading Euro-Atlantic practices.

5. **Construction of an ethical-legal and managerial framework for technological transformations:** A complex ethical-legal and regulatory framework for technological transformation in the security sphere has been developed. It identifies and addresses critical risks such as mass surveillance, algorithmic bias, and the violation of civil liberties, while simultaneously offering effective mechanisms for democratic, legal, and institutional oversight over new technologies.

6. **Systematization of the conceptual framework of the management cycle amidst high-tech revolutions:** A comprehensive macro-framework of the management cycle in security has been built through the prism of the "Industry 4.0 – 6.0" and "Security 4.0 – 6.0" concepts, linking each phase of the management process to specific technological solutions and their resulting strategic consequences.

7. **Theoretical differentiation of the evolution of security paradigms:** The evolutionary genesis of security from the "Security 1.0" phase to "Security 5.0" (with a forecasting vector toward "Security 6.0") has been systematized and analyzed. This evolution is derived in a tight cause-and-effect relationship with industrial revolutions, the dynamics of modern threats, and changing managerial architectures.

II. Scientific-Applied Contributions

1. **Development of an analytical toolkit for strategic planning:** Analytical tools fully applicable to practical strategic planning, forecasting, and structural reforms in the security sector have been created. The complex of comparative tables, matrices, and operational templates possesses high potential to directly

assist the processes of formulating national strategies, doctrines, and specific sector policies under Bulgarian conditions.

2. **Design of frameworks for assessing technological effectiveness:** Specialized frameworks for measuring the effectiveness of the management cycle through the deployment of specific high-tech solutions in intelligence and counterintelligence have been constructed. These frameworks can serve as applied methodological guides for designing, testing, and operationally implementing innovations in the practical work of the agencies.

3. **Modeling systems for human capital development:** Conceptual directions and innovative models for the education, qualification, and development of human resources in the context of digital transformation have been defined. These developments hold direct scientific-applied significance for establishing modern university curricula, internal institutional courses, and specialized scenario-based training for the intelligence community.

4. **Formulation of guidelines for regulatory and ethical excellence:** Scientifically grounded guidelines for optimizing the regulatory, legal, and ethical frameworks governing the use of new technologies in the security architecture have been proposed. The text provides ready-made conceptual solutions applicable to the preparation of legislative amendments, internal doctrinal documents, and mechanisms for independent auditing, evaluation, and continuous monitoring.

5. **Construction of a pragmatic model for digital transition:** A detailed, phased practical framework for a smooth transition from an analog to a high-tech digital management cycle has been established. It includes clear methodological steps for mapping existing processes, the phased digitization of information flows, and the implementation of key technologies at the core of primary operational activities.

6. **Creation of a reference framework for technological risk assessment:** An original reference framework for evaluating technological lag and its resulting

asymmetric risks to national security has been developed. Based on real comparative case studies and precise indicators of technological maturity, this framework provides a reliable scientific-practical basis for justifying budgetary investments and prioritizing modernization projects in the sector.

Credibility of the Material

The empirical and theoretical material presented in the dissertation thesis is distinguished by a very high degree of credibility. The author utilized legitimate, official, and scientifically recognized sources of information, including international strategic documents, regulatory acts, and reports from leading research institutes in the field of security. The conclusions and contributions rest upon a solid methodological foundation and objective analysis, which eliminates subjectivity and guarantees the scientific value and reliability of the obtained results.

4. Evaluation of the Scientific Results and Contributions of the Dissertation Thesis

The formulated scientific results and contributions in the dissertation thesis represent a large-scale accumulation of new, systemized, and interdisciplinary knowledge in this scientific field. They offer innovative theoretical models and pragmatic solutions for a total paradigmatic transformation of the management cycle in intelligence and counterintelligence through the deep integration of advanced technological systems.

In its theoretical aspect, the research successfully establishes a comprehensive concept of digital security management, which thoroughly deconstructs the transition from analog to digital architectures across all phases of the managerial process. The matrix models and operational templates developed by the author for each key technology provide a working methodological toolkit, strictly specified

for intelligence and counterintelligence tracks. A particular merit of the work is the original, critical historical-institutional reading of the evolution of the Bulgarian intelligence community from its inception to 2025, combined with a balanced ethical-legal framework that identifies and proposes mechanisms to neutralize the risks of mass surveillance, algorithmic bias, and civil rights violations.

In its scientific-applied aspect, the work offers a complete analytical apparatus of comparative tables, matrices, and technological templates aimed directly at optimizing strategic planning and implementing doctrinal reforms in the security sector in Bulgaria. The developed reference framework for a phased transition from an analog to a high-tech digital management cycle contains clear, applicable guidelines for regulatory excellence and the innovative development of human capital in the era of digital transformation.

An exceptionally high scientific achievement of this dissertation is its focus on synergetic effects. The author conclusively proves that the combined and coordinated application of modern technologies generates qualitatively higher efficiency compared to their isolated or fragmented use. The analytical unfolding of the "Security 4.0 – 6.0" concepts and their projection onto the management cycle represents an authentic and unique contribution that enriches both national and international specialized scientific literature. The achieved contributions decisively develop, prove, and build upon significant aspects of urgent scientific-practical problems.

Scope of Application of the Dissertation Thesis:

The results of this dissertation research possess a high degree of replicability and can find direct practical and scientific application among:

- Experts, strategic leaders, and analysts within state structures dedicated to protecting national security;

- Scientific research institutes and centers developing strategic analyses, forecasts, and concepts in the fields of security and defense;
- Higher education institutions and academies conducting training in specialties under professional field 9.1. "National Security" – to upgrade curricula, lecture courses, and simulation exercises.

All formulated contributions, scientific results, and conclusions are the personal, authentic work of the author. No signs of plagiarism or unauthorized borrowing were found in the text, and cited sources are correctly credited, confirming the candidate's high academic ethics and research maturity.

5. Evaluation of Publications Relevant to the Dissertation and Authorship

The scientific output accompanying the dissertation thesis is distinguished by high intensity and research maturity. The candidate's list of publications includes a total of 15 scientific titles, which fully reflect the main aspects of the dissertation research.

Particularly impressive is the fact that 11 of the presented publications are single-authored. This high share of individual scientific work is indisputable proof of the candidate’s established autonomous research profile and gives me full reason to categorically state that the achieved scientific-applied results, conceptual models, and contributions are the personal and authentic work of the author.

The style of the publications is characterized by depth of analysis, terminological precision, and a high level of academic discourse that remains accessible and logically structured for the expert community. The presented articles, reports, and monograph studies have been published in reputable specialized outlets, forming an organic and essential part of the scientific inquiry. They have successfully validated the results obtained in the dissertation within the scientific community and among practicing experts in the security sector.

6. Evaluation of the Abstract (Author's Summary)

The presented abstract has been prepared in full compliance with the regulatory requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA) and the internal regulations of the respective scientific organization/higher education institution. It possesses the necessary structure and volume, and it faithfully, accurately, and extractively reflects the core content, architecture, obtained empirical results, and original scientific contributions of the dissertation thesis.

7. Critical Remarks and Recommendations

The dissertation thesis was developed at an exceptionally high scientific level, which minimizes the grounds for substantial critical remarks regarding its content. In the spirit of scientific cooperation and with the goal of further developing the candidate's research potential, I offer the following recommendations:

- **Internationalization of scientific results:** I recommend that the author, building upon the massive and innovative results of this study, prepare and publish papers in reputable foreign journals referenced and indexed in globally recognized scientific databases (such as Scopus and Web of Science). This will ensure international visibility for Bulgarian scientific thought in the field of "Security 4.0 – 6.0."
- **Monographic codification of the work:** Given the exceptional relevance, comprehensiveness, and pioneering nature of the research, I highly recommend that the author adapt and publish the dissertation thesis as a standalone monograph (book). Such a work would become a valuable scientific tool for both the academic community and a wide range of experts and practitioners within the national security system.

8. Personal Impressions and Other Issues on Which the Reviewer Deems Fit to Comment

The author demonstrates deep scientific erudition and an extraordinary commitment to a topic that is of paramount relevance and fundamental significance for the contemporary management of national security. The work represents a comprehensive interdisciplinary study that successfully combines management theory, technological science, and legal and ethical analyses into a unified, systemic, and logically sound research concept.

I declare that I have no co-authored publications or conflicts of interest with Dr. Teodora Kirilova Licheva.

The candidate fully meets and exceeds all minimum national scientometric requirements for the award of the scientific degree of "Doctor of Sciences." According to the established criteria, Dr. Licheva accumulates a total of **380 points** against a legally required minimum of **350 points**, which is a definitive testament to her active and recognizable scientific research activity.

9. Conclusion

The dissertation thesis developed by Dr. Teodora Kirilova Licheva on the topic "Transformation of the Management Cycle in Intelligence and Counterintelligence through the Integration of Modern Technological Solutions" fully complies in its content, scientific volume, analytical depth, and structure with the requirements for acquiring the scientific degree of "Doctor of Sciences," as regulated by the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA) and the Regulations for its application.

The dissertation and the publications associated with it are the independent work of the candidate and successfully validate her claims to original scientific and scientific-applied contributions.

10. Evaluation of the Dissertation Thesis

My final evaluation of the dissertation thesis on the topic "Transformation of the Management Cycle in Intelligence and Counterintelligence through the Integration of Modern Technological Solutions," developed by Dr. Teodora Kirilova Licheva, is unequivocally **"POSITIVE."**

I confidently recommend to the esteemed Scientific Jury that they vote positively and award Dr. Teodora Kirilova Licheva the higher academic degree of **"Doctor of Sciences"** in the Professional Field **9.1. "National Security."**

Date: 25.07.2026

Reviewer: .....

(Signature)

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