

REVIEW

by Assoc. Prof. Dr. Michael Minev Dimitrov

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Professional Field 9.1. “National Security”

of a dissertation for a doctoral degree in Professional Field 9.1. “National Security” on the topic
“Blockchain Security in State Governance” with candidate Teodora Kirilova Licheva

1. Significance of the Researched Problem in Scientific and Applied Scientific Terms

The relevance of the chosen research problem is indisputable, considering the possibilities for applying blockchain-based solutions to ensure information security within the context of state governance. The doctoral candidate has examined the main directions in this regard – the applicability of a secure registry (accounting for vulnerabilities to phishing, routing, Sybil, and 51% attacks), identity management, and corruption limitation.

The results of the research work possess significance in a purely scientific context (in terms of defining the concept of “management security”) and in an applied scientific context, considering the best practices regarding the implementation of already existing similar systems and the specific requirements arising from the nature of activities in different state bodies and institutions. A more in-depth presentation in a comparative aspect represents a prospective direction for the continuation of the candidate’s research.

The reviewer notes a high degree of significance and relevance of the researched problem and the choice of topic, corresponding to the field of cognitive interest.

2. Clearly Formulated Goals and Objectives of the Dissertation

The goals and research tasks are contained in the introduction, although they are not clearly delineated. As a certain weakness, it should be noted that the object and subject of research are indicated solely in the abstract. Nevertheless, there they are formulated with the necessary precision and comprehensiveness. The exposition of the dissertation is subordinate to the general logic of the set goal and suggests successful argumentation and adequate assessment of the defended thesis.

The limitations set before the research are clear and contribute to achieving a result that meets the requirements laid down in Article 6, Paragraph 3 of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ЗПАКРБ).

3. Degree of Familiarity with the State of the Problem and Correspondence of the Used Literature

The doctoral candidate demonstrates a free command of the professional language concerning the discussion of issues related to cybersecurity and the application of blockchain technologies. The practical



experience of the author contributes to the comparison of accumulated tacit knowledge with the attracted theoretical systematizations and the construction of this basis for logically substantiated conclusions and suggestions.

In developing the dissertation work, 86 sources have been used – 10 in Cyrillic, 13 in Latin, 1 in Chinese, and 62 electronic. A certain weakness should be defined as the lack of numbering and formatting according to a citation standard. Among the authors of the attracted works, leading researchers in the field stand out. The main part of the sources used in the research is in electronic format, which stems from and is in direct connection with the peculiarities of the problem under consideration.

The reviewer notes that the doctoral candidate possesses a satisfactory level of knowledge of the researched problem both from a theoretical point of view and from a practical application perspective.

4. Correctness in Citing a Representative Number of Authors

The doctoral candidate distinguishes their reasoning from that of the authors cited. In the footnotes, all required components concerning literary sources are indicated. It would be advisable in the future, when citing internet sources, to specify the type, author, date of announcement, and date of access.

Upon checking with specialized software for combating plagiarism, a value of 3.13% by match coefficient No. 2 was established, confirming the author's correctness.

5. Presence of a Justified and Developed Theoretical Model of the Research

The theoretical model of the research is clearly outlined in the introduction and successfully implemented in the main part of the dissertation. Through the sequential examination of the types of blockchain systems, along with their place in the general efforts to modernize state governance and the peculiarities of the main blockchain platforms, including “Bitcoin,” Ripple, Ethereum, and Hyperledger, prerequisites are created for formulating recommendations regarding their implementation in the state and private sectors. The author has not adhered to the traditional dissertation work distribution of research work (clear distinction between informational and analytical parts), which on the one hand creates a sense of fragmentation, but on the other hand gives a clearly expressed scientific-applied character to the development. The volume of the field of research necessitates adherence to such an approach, which operationalizes the created conceptual framework. The reviewer accepts that the limitations before the dissertation justify considering the work carried out as having a holistic character, but recommends that the author continue in the direction of comparing specific solutions based on blockchain and offering approaches for bringing measurability to the overall effectiveness, including in relation to “traditional” solutions such as IDS, based on “fingerprints” and anomalies.

The reviewer notes that the doctoral candidate has developed a satisfactory theoretical model for the research.

6. Correspondence of the Chosen Methodology and Research Methodology with the Set Goals and Tasks of the Dissertation Work

The doctoral candidate successfully carries out research work by applying a deductive and systematic approach and the fundamental methods of analysis and comparative analysis. This contributes to the derivation of the best existing practices and outlining the applicability of the different types of blockchain systems.

The reviewer notes a correspondence between the chosen research methodology and the goals set before the dissertation work.



7. Presence of Personal Contribution in the Collection and Analysis of Empirical Data

The volume of sources used is significant and combines the contributions of researchers from differing professional and sociocultural contexts. This contributes to the extraction of new information from existing empirical data, which argues for and recognizes the author's own contribution in this regard.

Description of Contributions:

1. Brief Characterization of the Nature and Assessment of the Reliability of the Material on Which the Contributions of the Dissertation Work Are Built.

The reviewer notes that the contributions claimed by the author in their work are real and supports them to be accepted as such. Their formulation is the result of actual research work, and although the implementation of a procedure for the application of blockchain in the public sector is a distant goal, the doctoral candidate should be accepted as a researcher contributing to its achievement.

The consistency of the presentation of the material and the author's reasoning do not raise doubts about the reliability and authenticity of the defined contributions.

2. Description of the candidate's contributions and their classification.

a) The dissertation should demonstrate that the candidate possesses in-depth theoretical knowledge in the respective specialty and capabilities for independent scientific research

The doctoral student not only demonstrates in-depth theoretical knowledge but also the ability to codify and synthesize their own practical experience in the field of study. The chosen approach, work with sources, and the combination of the descriptive level with efforts to derive abstract concepts, reinforce the conclusion that the author is capable of conducting independent scientific research, the depth of which corresponds to the level required for obtaining the educational and scientific degree of "Doctor".

The two contributions claimed by the doctoral student are balanced between the theoretical and scientific-applied field, and can be perceived as complementing and developing the knowledge and practice in the problem area.

3. Assessment of the degree of personal participation of the candidate in the contributions

The reviewer has no reason to believe that the aforementioned contributions are not the result of the candidate's independent research work. This is confirmed by the conducted verification and conclusion regarding the correctness of the citations.

4. Evaluation of the correspondence of the abstract with the main positions and contributions of the dissertation

The volume and content of the abstract to the dissertation contribute to the clear delineation of the contributory moments. The included information is sufficient, and the exceeding of the usual volume again stems from the peculiarities of the chosen topic.

Impacts of the dissertation on the external environment.

1. Assessment of the publications on the dissertation: number, nature of the editions in which they are published

The doctoral student has submitted a list of scientific publications on the topic of the dissertation, consisting of 2 monographs and 9 articles. The reviewer determines the presence of published monographs on the topic as an indicator of the author's degree of preparation and familiarity with the researched



problem. The articles are published in prestigious editions, one of which is in English. The majority of the indicated scientific production is focused on the practical implementation of blockchain technologies.

The presented publications meet and significantly exceed the requirements for awarding the educational and scientific degree of “Doctor”.

2. Use and citation by other authors, reviews in the scientific press, etc.

The reviewer cannot make an assessment of the degree of impact of the applied scientific publications on the external environment, as they do not have information about citations by other authors. However, considering the topicality of the dissertation and its depth, it is likely to be of interest to a wide audience - from representatives of the academic community to experts and students.

Personal qualities of the author

The reviewer is not familiar with the author of the dissertation.

Opinions, recommendations, and notes.

I believe that the doctoral student has worked conscientiously on the topic, has tried to achieve the highest possible concentration of knowledge in the dissertation, while successfully adhering to setting reasonable boundaries regarding the overall volume.

Considering the presence of already published monographs, I recommend that the author develop textbooks on the topic and prepare lecture materials to be included in relevant bachelor’s and master’s programs.

As notes, I would offer the following:

- There are technical errors present that, in places, affect the transmission of meaning. Before proceeding to potentially implement the already formulated recommendation, the text would benefit from additional editing.
- The excessive fragmentation of subheadings negatively affects the perception of the text. While on one hand, this is useful for organizing content, in this case, it produces an accompanying negative effect.

I have the following question for the doctoral candidate:

- How do you see the possibility of implementing blockchain systems in public administration - as an open or closed system? If the system is closed, how do you plan to address the problem regarding the required computational power?

Conclusion with a clearly formulated positive or negative evaluation of the dissertation

Based on the developed dissertation, the attached list of scientific publications, and the demonstrated skills for conducting independent research, I give a positive evaluation. I ascertain that the presented dissertation meets the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the regulations for its application. I will vote for awarding the educational and scientific degree of “Doctor” to Teodora Licheva in professional direction 9.1. National Security.

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Reviewer: Assoc. Prof. Dr. Michael Dimitrov