

REVIEW

of a Dissertation

for the award of the educational and scientific degree "Doctor" in

Field of Higher Education 4. Natural Sciences, Mathematics and Informatics

Professional Field 4.6. Informatics and Computer Science

Doctoral Programme: "Information Systems and Technologies, Informatics and Computer Science"

Author: Raheli Menda Shabat Mor, MSc

Topic: "The Impact of Regulation (EU) 2019/881 (Cybersecurity Act) on the Expansion of Cybersecurity Certifications"

Scientific Supervisors: Assoc. Prof. Dr. Zlatogor Minchev; Assoc. Prof. Dr. Galina Mileva

Reviewer: Prof. Teodora Ivanova Bakardjieva, PhD, Eng.

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This review has been prepared based on the decision of the Rector of Varna Free University "Chernorizets Hrabar", issued by Order No. 256/30.04.2026.

1. General Characteristics of the Dissertation

The dissertation submitted by Raheli Menda Shabat Mor is devoted to a timely and significant topic related to the impact of Regulation (EU) 2019/881, known as the Cybersecurity Act, on the development and adoption of cybersecurity certification schemes and regulations in the field of private security within the European digital environment.

The main objective of the dissertation is to develop scientifically grounded and harmonized models that support the forecasting of the successful integration of private certification schemes into the broader certification ecosystem, as well as to formalize these models into a robust decision-making framework for selecting a certification organization.

To achieve this objective, the following tasks are addressed: assessment of quality and effectiveness; analysis of regulatory impact; development of harmonization strategies; examination of trust mechanisms; assessment of market acceptance and scalability; formulation of a CAB decision-making model.

The relevance of the topic is particularly high in view of the growing importance of cybersecurity governance, the need to harmonize security standards, and the increasing demand for reliable digital services and products. The dissertation examines issues related to cybersecurity certification, regulatory frameworks, and the interaction between public regulation and private-sector implementation mechanisms.

The dissertation is logically developed and well structured. It comprises an introduction, three chapters, conclusions, references, and appendices. The author clearly presents the objectives, research tasks, methodology, and scientific hypothesis of the study.

The submitted work demonstrates an interdisciplinary approach by integrating aspects of cybersecurity, regulatory policy, information security management, risk management, and digital trust frameworks. The author examines both the legal foundations of the Cybersecurity Act and its practical implications for organizations and private certification schemes.

A positive impression is created by the effort to link the theoretical analysis with practical implementation perspectives concerning certification mechanisms, compliance processes, and cybersecurity assurance.

2. Evaluation of the Scientific and Practical Results and Contributions

The dissertation contains scientific-applied and applied contributions related to the analysis and assessment of the impact of Regulation (EU) 2019/881 on cybersecurity certification and private security schemes. The main scientific and practical contributions may be summarized as follows:

Scientific-Applied Contributions

1. A conceptual framework entitled "Private Schemes Forecasting Model (PSF)" has been developed for assessing the effectiveness and sustainability of

private cybersecurity certification schemes in the context of Regulation (EU) 2019/881.

2. A methodological approach for evaluating the effectiveness of cybersecurity certification has been proposed and empirically validated.
3. An original Private Scheme Selection (PSS) model has been developed to support the selection and assessment of Conformity Assessment Bodies (CABs). The model integrates fuzzy logic and optimization techniques through the application of the Fuzzy Prioritization Method (FPM) for processing expert assessments under conditions of uncertainty.
4. A structured methodological process for CAB selection has been formulated and validated. It includes the definition of evaluation criteria, pairwise comparison procedures, fuzzy transformation, optimization through geometric mean calculation, defuzzification, and mechanisms supporting the decision-making process.

Applied Contributions

1. An integrated framework has been developed and validated, combining the strategic forecasting capabilities of the PSF model with the operational mechanisms of the PSS model. The framework establishes a closed-loop approach that links cybersecurity certification planning, conformity assessment procedures, and organizational cybersecurity management activities.
2. The validation of the developed PSF and PSS models has been carried out through comparative analysis, expert assessment procedures, and application in cybersecurity certification scenarios related to IoT environments and private certification schemes under the framework of the Cybersecurity Act.

The work demonstrates a good command of the current state of research in the field. The candidate applies an appropriate scientific methodology and uses comparative and analytical approaches that are relevant to the stated research objectives.

The results obtained have both theoretical and practical significance. They could be useful to researchers, cybersecurity specialists, organizations implementing

certification schemes, as well as institutions engaged in cybersecurity governance and compliance.

3. Publications Related to the Dissertation

The doctoral candidate has presented one scientific publication from 2026, related to the topic of the dissertation and published in a scientific venue indexed in Scopus, as well as three presentations at international scientific conferences and forums dedicated to cybersecurity, information systems, and digital technologies.

The publication activity complies with the minimum national requirements for the award of the educational and scientific degree "Doctor".

No citation data have been provided by the doctoral candidate.

4. Critical Remarks and Recommendations

The dissertation is distinguished by a high degree of relevance and a well-structured analytical approach. At the same time, several recommendations may be made:

In certain sections, the exposition has a more descriptive character and could be improved through a more synthesized presentation of the regulatory frameworks under consideration.

The practical applicability of the formulated conclusions could be further strengthened through broader empirical verification or through case studies involving organizations that implement cybersecurity certification schemes.

Future research could further examine the relationship between European cybersecurity regulations, sector-specific certification frameworks, and emerging technologies, including cloud services, artificial intelligence systems, and Internet of Things ecosystems.

5. Personal Impressions

The submitted materials demonstrate good theoretical preparation, analytical thinking, and the ability to conduct independent scientific research. The doctoral candidate demonstrates an understanding of complex issues related to cybersecurity governance, as well as the ability to work with interdisciplinary scientific material.

6. Conclusion

The formulated recommendations and remarks do not diminish the value of the dissertation.

The doctoral candidate possesses in-depth theoretical knowledge of the subject matter, as well as the capacity to conduct independent scientific research and to implement the achieved results in practice.

I consider the dissertation to be timely, and the proposed methodologies may find broad application in various fields. In terms of the significance of the research, the submitted dissertation represents an in-depth and complete research work containing sufficient scientific and applied contributions. The requirements of the Development of Academic Staff in the Republic of Bulgaria Act and its Implementing Regulations have been fulfilled, as have the Rules and Procedures for the Admission and Training of Doctoral Students and the Acquisition of the Educational and Scientific Degree "Doctor" at Varna Free University "Chernorizets Hrabar".

The achieved results provide me with sufficient grounds to give a positive assessment of the submitted dissertation and to propose to the esteemed Scientific Jury to award Raheli Menda Shabat Mor the educational and scientific degree "Doctor" in the doctoral programme "Information Systems and Technologies, Informatics and Computer Science", Professional Field 4.6. "Informatics and Computer Science".

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