OPINION

by Prof. Dr. Radoslav Yoshinov,

on the dissertation work for the acquisition of educational and scientific **degree "Doctor" with** author **Mag. Ivan Kostadinov Gaidarski on** "Method and **models** for the development of information security systems in organizations" under the scientific guidance of Assoc. prof. Dr. Ruman Andreev PhD program: "Computer systems, complexes and networks" in professional field: 5.3. Communication and computer equipment

1. Actuality of the dissertation work

Cybersecurity research and industrial cyber security solutions are lagging behind the pace at which hackers improve and apply sophistic methods and technologies for cyber attacks. The consequences of these incidents in the case of information security systems in critical infrastructure organisations, as well as energy industries, water resource management and industrial production, can have an impact on national security or lead to human casualties. constraints and organisational weaknesses by sharing the services of crisis, disaster and accident management centres, between different critical infrastructure actors, individual industries, including at national and supranational level. The importance and actuality of the dissertation work, the purpose of which is to create a method and models for the development of information security systems providing protection from internal threats in the direction of inside and out sensitive information of different nature and size, is immediately visible.

2. Degree of knowledge of the state of the problem and general characteristic of work

The dissertation provides an in-depth overview analysis of the need to improve the cyber security of digital technologies that apply to the management of information security systems in organizations, taking into account the continuous increase in the number of security incidents in all digital-based systems as a result of the actions of malicious actors.

The bibliography of the dissertation cited 139 literary sources: books, scientific articles and internet publications. The methods and means of risk assessment in the field of cybersecurity and cyber security have been analysed in detail.

General feature of the dissertation work includes - introduction, four chapters and conclusion, declaration of originality of results, bibliography and applications. The dissertation work is in a volume of 142 pages, 48 figures, 13 tables, 139 quoted literary sources and 2 applications.

The above proves that the PhD student has in-depth knowledge in the subject of the studies carried out.

3. Compliance with the proposed research methodology and the objectives and tasks of the dissertation work

An analysis of the regulatory base, standards, frameworks and good practices concerning cybersecurity has been carried out. The purpose of this analysis is to clarify the limitations according to the legislation and recommendations of the standards to be basic for synthesizing the conceptual cybersecurity model.

In order to achieve the objective of this work, a methodology for an object-oriented approach to the design and implementation of top-down software systems has been applied. .

In carrying out the studies, it has formulated a development method that achieves a high degree of formalisation. The result achieved is usually   a step towards achieving a reference model for the establishment of the programme system concerned.

The development has interesting summaries and guidelines for future development.

The selected methods correspond to the main purpose and tasks set for solving by the PhD student.

4. Characteristic of the nature and assessment of the reliability of the material on which the dissertation contributions are based

The model that is created and used corresponds to the target task. It is a concept of solutions and guidance has been given for future research.

I have not noticed any errors in either the specific or the conceptual models. I also find that the proposed strategies are well founded.

5. Contributions of the dissertation work

The PhD student has claims for 7 Scientific and Scientific applicative Contributions:

1. A new classification of IS management approaches has been proposed, in line with the depending on the type of communication

2. A new method for the development of information technology systems has been proposed organisations that integrate model-based development into the development of Sistemis for Information Security;

3. A multi-layer conceptual model of the problem area of the information security systems as a result of the application of two or more points of view in its description;

4. Architectural and functional models of the systems for the information security on the basis of an existing conceptual model of the problem area using the object-oriented Unified Development language for describing UML programming systems;5. Comparative analysis of existing PID platforms for the implementation of requirements described in the analysis model;

6. A model for the implementation of THEIS has been proposed in an organisation using platform for implementing "Cososys Endpoint Protector 5.0.2.1"

7. A simulation model of the SIS has been implemented on the basis of an object-oriented

a description of its architecture using agent-based representation in the NetLogo and I-SCIP-SA media; Simulation study of the architecture of the SIS by performing a 100-year validation and interactive verification

The reviewer accepts all contributions as Scientific applicative.

6. Degree of personal participation

For the personal participation of the PhD student, I judge by the audience activity of the PhD student reflected in the materials published under the dissertation. The PhD student convincingly presents the results achieved, with a very good and thorough argumentation, as well as uses professional graphical layout of the materials.

The nature of the study implies very good and extensive preparation in the field. I believe that the PhD student has done well by not questioning her personal involvement in the development of the dissertation material.

7. Assessment of publications on the dissertation work

On the subject of the dissertation work, 5 publications were made in co-authorship. They're all in English.

The lack of self-employment is attributed to the fact that the area is definitely interdisciplinary.

The publications reflect the more substantial results achieved in the dissertation work. The dissertation publications were reported and accepted for publication in the collections of three international conferences, one in a specialized international journal with impact factor and one in an edition of an international academic publishing house

8. Compliance of the author with the requirements for its preparation and adequacy of reflection of the basics and contributions of the dissertation work

The submitted draft author's certificate is in accordance with the rules for the preparation of the authors of the dissertation papers, as set out in the website of IICT. Reflects the results achieved, as well as the contributions of the author. Graphically it is very well formed and includes the necessary information describing the dissertation work in summary.

9. Opinions, recommendations and notes

The dissertation work develops a very complex, dynamically evolving and promising field – an analysis of the need to improve cyber protection of digital technologies, taking into account the continuous increase in the number of security incidents in all systems that are based on digital technologies as a result of the actions of malicious actors. This implies sufficient in-depth knowledge, the ability to interpret and formulate strategies for the effective development of the field. Meaningfully and graphically, the material was developed very well. I recommend more

accurate verbalization by the PhD student of his achievements - to learn more clearly and briefly to lay out his contributions.

CONCLUSION

The content and contributions of the dissertation work of mag. Ivan Kostadinov Gaidarski fully covers the requirements of the Law on development of the academic staff of the Republic of Bulgaria, the Regulations for its application and the Rules of Procedure for acquiring scientific degrees in IICT-BAS. The educational doctoral minimum set in the individual plan is covered. It is undeniable the PhD student's personal involvement in the development of the dissertation and the contributions received. This gives me reason to strongly recommend to the the Honorable Scientific Jury to award to **mag. Ivan Kostadinov Gaidarski** the educational and scientific degree **"Doctor"** in Professional field 5.3. Communication and computer equipment

На основание
ЗЗЛД

REV

/prof. Dr. R. Yoshinov/

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