REVIEW

by Prof. Ivan Ganchev Garvanov - ULSIT

Member of the Scientific Jury, appointed by Order of the Director of IICT-BAS

№ 48 / 24.02.2022

SUBJECT: Dissertation of Ivan Kostadinov Gaydarski on "Method and models for development of information security systems in organizations", presented for the acquisition of educational and scientific degree "Doctor" in the doctoral program "Computer Systems, Complexes and Networks", professional field 5.3. "Communication and Computer Engineering", with scientific supervisor: Assoc. Prof. Rumen Andreev.

1. General description

At the first meeting of the Scientific Jury I was chosen to write a review and received the following documents:

- dissertation;
- abstract in Bulgarian and abstract in English.

2. Relevance, aim and tasks

The topic of the dissertation is extremely relevant given that in recent years with the development of electronics, information has become easier to access and therefore easier to manipulate and abuse. The protection of information is essential for the functioning of organizations and the world at large. Improving information security systems is a current scientific challenge that faces many challenges.

The aim of the dissertation is to propose a method and development of models of information security systems, providing protection from internal threats from the inside out of sensitive information about different in nature and size organizations.

To achieve the goal of the dissertation the following research tasks are formulated:

1. Defining and classifying approaches to information security management and areas of application; 2. Analysis of the field of "Information Security" as part of the problem area of the information security system; 3. Description of the problem area of information security systems in organizations through conceptual modeling; 4. Analysis and application of object-oriented approach in creating a project model of an information security system based on a conceptual model; 5. Defining an approach for transforming the SIS project model into an implementation model; 6. Simulation of SIS and analysis of the generated test data.

3. General characteristics of the dissertation

The dissertation consists of 153 pages, structured in an introduction, four chapters, conclusion, contributions, list of dissertation publications, list of cited references, bibliography and appendices.

Chapter 1 discusses the basic concepts, management approaches and basic principles for information security. Areas of application are described, as well as possible problems in the use of IP systems. A method for developing information security systems has been proposed. The purpose and tasks of the dissertation are formulated.

Chapter 2 defines the basic concepts in IS by taking into account the views of all stakeholders in the development of the SIS. The analysis is the basis for creating a conceptual model of the SIS.

Chapter 3 presents a method for designing SIS, designed for organizations and aimed at protection against leakage of sensitive information from the inside out, ie. as a result of the actions of insiders with legitimate access to the resources of the organization and its data. The possibilities of object-oriented approach for creating a project model of SIS are considered. A way to transform the SIS conceptual model into an object-oriented

design model by using the object-oriented UML description language is shown. The results are presented in publications numbers 1 and 2.

Chapter 4 describes an approach to creating a SIS implementation model. An object-oriented model in accordance with the existing implementation environment is proposed. An analysis of the problem area has been performed and based on the developed conceptual model, as a result of this analysis, the requirements to the architecture of the developed SIS have been specified. Results of tests of an extended SIS are also presented. An agent-based implementation model has been created by transforming an object-oriented design model. Based on the agent-based model, the operation of the SIS was simulated using the NetLogo simulation environments (v.6.0.4) and I-SCIP-SA. An analysis was performed on the basis of test data, as well as data from real situations. The results are presented in publications numbers 3, 4 and 5.

4. Contributions

I accept the contributions presented in the dissertation as defined by the doctoral student and evaluate them as contributions of scientific and for the most part of scientific and applied nature. I accept the contributions as significant, real and enriching the existing theory and practice of information security systems.

5. Abstract

The presented two versions of the abstract in Bulgarian and English reliably reflect the content of the dissertation and meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria. From the attached declaration of originality of the presented results, as well as from the presented publications on the dissertation, it can be judged that the described results are the personal work of the doctoral student.

6. Assessment of compliance with the minimum national requirements

The doctoral student Ivan Gaydarski has tested parts of his dissertation in five scientific publications, all in English. One of the publications is in an open source journal, one is in an international conference with SJR and three are in proceedings of international scientific conferences.

I believe that the publications submitted by the candidate for review in the competition are for the most part his personal work, despite the co-authorship of most of them. The presence of more than one author in the publications shows that he manages to work well in a team and get high scientific results, which is confirmed by the places of their publication. I have not noticed plagiarism in the doctoral dissertation and publications.

According to the minimum national requirements for obtaining "Doctor" in a professional field 5.3. "Communication and Computer Engineering", defined in the Law on the Development of the Academic Staff in the Republic of Bulgaria requires at least 30 points on the Group of Indicators G. The same number of points is required by the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions in BAS and the Regulations for the specific conditions for acquiring scientific degrees and for holding academic positions in IICT-BAS. The presented publications on the dissertation form a total sum of points for the indicators from Group G equal to 70 points, which significantly exceeds the required minimum of 30 points.

Attached is a list of citations which shows that two of the candidate's publications are cited in 4 scientific publications.

7. Notes and recommendations

Some of the presented results in the dissertation are not reflected in the dissertation publications and my recommendation is to publish them.

8. Final complex assessment

I believe that the presented dissertation meets the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria. The achieved results give me reason to fully give a positive assessment and I recommend to the esteemed Scientific Jury to award the educational and scientific degree "Doctor" of Ivan Kostadinov Gaydarski in a professional direction - 5.3. "Communication and Computer Engineering", doctoral program - "Computer Systems, Complexes and Networks".

22.03.2022

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