

# OPINION

*from Assoc. Prof. Ph.D., Rossitza Ivanova Goleva, New Bulgarian University, Department of Informatics, professional field 4.6 Informatics and Computer Science on the dissertation **HOLISTIC APPROACH TO SOFTWARE QUALITY MANAGEMENT** of Dobromir Mitkov Dinev, candidate for the Ph.D., professional field 4.6 Informatics and Computer Science*

## 1. Common Information

According to the order № 3-PK-97/30.01.2024 of the Rector of the New Bulgarian University and in conformance with the conditions under the Regulations for application of ZRAS in the Republic of Bulgaria (articles 8, 9, 10 and 11), Law on the Development of Academic Staff in the Republic of Bulgaria and the Ordinance on the Development of Academic Staff of NBU (article 14) I have been appointed to be a member of the scientific jury and according to the minutes of the first meeting on 30.01.2024 I have been appointed to prepare an opinion.

The presented dissertation contains 164 pages together with the figures, tables, code in R and bibliography. It is structured in three main chapters. The dissertation is written in English, the style is good with many descriptions in detail. The work is readable. The Ph. D. candidate presents a declaration of originality of the results as well as all necessary administrative documents for this procedure.

Dobromir Mitkov Dinev started his Ph. D. study on 1.10.2027 in accordance with the order of the Rector of NBU 3-PK-57/8.11.2017 for three years. He finished its Ph. D. as an educational procedure three years later in accordance with the order of the Rector of the New Bulgarian University 3-PK-8/13.10.2020.

Dobromir Dinev teaches in different programmes in the Department of Informatics on 10 different courses. The content of most of the courses taught D. Dinev developed himself.

In the next table main parameters of the work of D. Dinev is summarized in conformance to the Regulations for application of ZRAS in the Republic of Bulgaria (articles 8, 9, 10 and 11), Law on the Development of Academic Staff in the Republic of Bulgaria and the Ordinance on the Development of Academic Staff of NBU (article 14):

Doctor Degree	Documents and evidence
Article 4 (1) The Ph. D. degree is appointed to the people with master's degree and after education in Ph.D. programme in accordance to the ZRAS in the Republic of Bulgaria	Dobromir Dinev was a student in the programme on Project management in information technologies. He presented transcript of records from the electronic records of NBU.
Education in Ph. D. programmes are in a regular presence form and in the form of self-study. It could be paid or granted.	There are orders of the Rector of the NBU for beginning and ending of the education.
(4) Education of Ph. D. Students at NBU is performed in accredited programmes and by departments where there is at least one Associate Professor of Professor in the field of study during the period of education. The duration of study is three years.	Department of Informatics is responsible for the accredited Ph. D. program on Informatics. The data is officially published on the webpage of the national agency of accreditation of R. Bulgaria. The orders of the Rector of NBU for the beginning and ending of study period show three years of education of D. Dinev.
Article 56, to conform by the minimal requirements for the position as stated in the law and ordinance.	The table below demonstrates the conformance to the minimal requirements for the degree of Mr. Dinev. Mr. Dinev presents in the dissertation 4

	publications. 1 of them is indexed in Scopus with SJR and could be counted with 10 points. These 10 points are multiplied by 3 in accordance with the ordinance and the final score received is 30 points. This publication conforms to the national requirements for the Ph. D.
Art. 56, para 2, p.5. not to have legally proven plagiarism in scientific works	There are no pieces of evidence for plagiarism related to this procedure.

*Area 4. Natural Sciences, Mathematics, and Informatics, Professional field 4.6. Informatics and Computer Science*

Group of indicators	Content	Associate Professor (min. Points)	Presented by the candidate in the competition
A	Indicator 1	50	50
B	Indicator 2	0	
C	Indicators 3 or 4	0	
D	A sum of indicators from 5 to 9	30	30
E	A sum of indicators from 10 to 12		
F	A sum of indicators from 13 to 20	0	

## **2. Research significance and levels of contribution**

Dobromir Dinev has worked intensively in the field of software quality estimation for the last 7 years. He gathers, performs, and analyze many opinions and data from the professionals in SMEs and big companies in and outside Bulgaria.

In his work Mr. Dinev formulates the aim and the tasks of his research on the holistic approach towards software quality and proposes a new model for it. He presents the analyses and results in the three main chapters of the dissertation where the problems are formulated, analyzed and a matter of intensive research such as:

1. A new holistic model of software quality is defined. The quality is presented as being subjective and objective, it is described from different points of view. An economic analysis of the necessity and detail of the software quality is presented.
2. The main paradigms of quality management are defined. A new term “holistic software quality” and its range is defined and well analyzed.
3. A new meta model of the holistic quality is created together with its elements and triggers, e.g., the term “impactor” is defined to present the triggers or events that influence the quality of the software. The interdependence between the impactors is demonstrated (more than 60 impactors are analyzed) to show their influence on the transformation of the meta model.
4. Multiple questionnaires and conversations have been performed to collect the opinion of the professionals on the holistic approach towards software quality. The research includes the analyses of the influence of the duration of the software production and delivery to the number of bugs and the time of its fixing. The questionnaires are collected in Bulgaria and outside Bulgaria.

## **2. Level of the aim and tasks formulation in the Ph. D. thesis**

The aim and the tasks in the Ph. D. thesis of Mr. Dinev are clear and well defined. At the end of his work, he presented all contributions with evidence in a table referencing specific text, tables, figures from the thesis. The approach is systematic, and the research plan and performance are presented in

sufficient detail. The contribution of the Ph. D. candidate is based on clear analyses, calculations and research and are well presented in the text.

### **3. Conformance to the research methodology and methods and aims and tasks defined in the thesis**

The thesis of Mr. Dinev on the topic of holistic approach for the estimation of the software quality and the presented meta-model conform to the aim and the tasks completely. The selected methodology and methods for research demonstrate the implemented variety of ways of solving tasks. The methods are selected from the literature review and adapted for the research tasks. The selection of the meta model is in conformance with the recent tendencies of the modelling of complex systems and its analyses with the use of the finite-state-automata.

### **4. Scientific and scientific-applicable contributions of the thesis including the presence of the original results for the science**

The meta model created in this thesis could be classified as a scientific contribution. The other contributions are more implementation related. I do not think there is an original contribution to science at present work. The proposed meta model could become such a significant contribution if it is developed further and published by Mr. Dinev.

### **5. Level of publication in the thesis: number, publisher, level of the issues**

Conforming with the requirements of group A there is a thesis presented and a score of 50 points are plotted in the table. For the conformance with the requirements in group G 4 publications are presented. One of them is indexed in Scopus with SJR and is graded with 30 points ([https://link.springer.com/chapter/10.1007/978-3-031-44668-9\\_10](https://link.springer.com/chapter/10.1007/978-3-031-44668-9_10)).

The presented publications correspond to the content of the thesis. The main contributions of the author are published. There are still unpublished original results in the thesis that could be published soon.

Mr. Dinev totally presented 15 publications in his CV in regional and international conferences.

These publications are a good demonstration for the attitude of Mr. Dinev in research since the time he was a student in master's degree.

### **6. Citations by other authors**

There are no citations noticed regarding the work of Mr. Dinev. His registration on the world-wide databases and research communities may improve his presence in the community and influence citations of his works.

### **7. Opinion, recommendations, and notes**

I do not have any critical notes for Mr. Dinev. My recommendations are to enhance the topics of his research. The description of the works and especially the literature review are too descriptive. The text looks like a book rather than being a Ph. D. thesis. This does not harm the overall good impression of the work under review.

The contribution of the work could be defined in a better way. Mr. Dinev could be more precise in his next publications.

Almost all publications of Mr. Dinev are presented at regional conferences and the only author is Mr. Dinev. I recommend him to contact other professionals and try to make cooperative research and publications in indexed issues. This will increase the level of his research.

Mr. Dinev has no registration with Scopus or Web of Science. My recommendation is to do so. This may also increase his presence in the community and provoke citations.

Is it possible for Mr. Dinev to explain the way the software companies have solved the problem of software testing recently? What kind of approaches are implemented for quality management when the companies test manually, semi-manually and automatically the software quality?

It is well-known that complex systems are described hierarchically. Is it possible to describe the holistic approach and model towards the software quality with the hierarchy of the software products?

**8. Conclusion with clear positive or negative estimation of the thesis**

With this opinion I would like to show that the candidate Dobromir Dinev conforms to the requirements of the doctor degree completely in accordance with the law and ordinance.

Taking into account the fulfilment of all requirements, according to law for the development of the academic staff in the Republic of Bulgaria, the regulations for its application, as well as the Ordinance for the development of the academic staff of NBU, incl. the reports on the fulfilment of the minimum national requirements, the scient metric indicators from Scopus **the candidate fully satisfies the requirements for holding the degree “doctor”. All this gives me enough reason to give a positive assessment** and I propose to the scientific jury to vote on a proposal to the Academic Council of the New Bulgarian University - Sofia to grant the degree “doctor” to Dobromir Mitkov Dinev in the professional field 4.6 "Informatics and Computer Science".

Date 20.03.2024

Signature .....