



ИКОНОМИЧЕСКИ УНИВЕРСИТЕТ ВАРНА

OPINION

Bx. № PA 20-1445/01.12.2022г. By prof. Dr. Julian Vassilev

University of Economics – Varna,

Professor in professional field (PF) 4.6 "Informatics and Computer Science",
validated in the register of academic staff of NACID "Habilitation persons with
scientific indicators"

Possessing "Doctor" degree in PF 3.8; doctoral program "Application of
Computing in Economics"

Dissertation author: PhD student Svetoslav Ivanov

Thesis: Management of the development, maintenance and tracking of
software by technology startups

Scientific director: Assoc. Prof. Dr. Sc. Pavel Petrov

**Primary unit that opened the procedure for defending the
dissertation:** Department of Informatics, University of Economics – Varna

Reason for writing the opinion: Order No RD 06-190/08.11.2022 of the
Rector of the University of Economics – Varna for opening a procedure for
protection and determination of the composition of a scientific jury; first
meeting of the scientific jury held on 11.11.2022.

Professional field: 3.8 Economics

Doctoral Program: Application of Computing in Economics

I. General notes

The work is 164 pages. The uniqueness of the text is 93%.

The aim of the dissertation is "to develop a project of a software system
that, applied with an appropriate approach to process management, will
successfully support the activities of technology start-ups". **The object** of the
study is technology startups. **The subject** of the study is the process of
development of software products.

The first chapter (54 pages) is entitled "Theoretical Foundations of
Software Technology Startups". A number of features related to software
development startups are being explored.

A second chapter (41 pages) is entitled "Software system for managing
the production of software in technology startups". A conceptual and logical

model of the system using formal means has been developed. The functionality is described.

Chapter 3 (40 pages) is titled "Building and Using a Software Development Management System in BitPioneers Black Sea Ltd." An overview and selection of software technologies is made.

The **conclusion** provides conclusions and guidelines for future work.

A reference is given to the contributions.

II. Positive moments

In **first chapter**, the author has brought out a set of problems arising in technology startups.

In **second chapter**, formal means have been used to describe the conceptual and logical model of the system.

In **third chapter**, an approbation of the developed model is made in a technology start-up company developing your software.

The **publication reference** shows visibility of certain parts of the dissertation.

The presented publications cover the **minimum national requirements for PhD degree** in professional field 3.8.

I accept the **contributions** as achievements of the author.

The **autoreferate** (39 pages) presents significant parts of the work.

The author of the dissertation reports the following publications on the topic of the work: **3 articles in journals** and **5 papers at conferences**. All **publications** are in indexed editions and are visible in full-text version.

Some of the publications of **Svetoslav Ivanov** are independent; others are joint with the supervisor and other colleagues. In **Scopus** there are 4 publications, 13 citations, h-index: 3.

III. Notes and recommendations. Questions

The manuscript has been discussed twice at the Department of Informatics (on 25.01.2022 and on 14.10.2022). During the discussions, colleagues who have prepared internal reviews and opinions have given a number of comments and recommendations, which are subsequently reflected.

After the last discussion of the work at the Department of Informatics, when a decision is taken to open a procedure for protection, some notes are given, which are also reflected in the final version of the manuscript – in the

version given to the members of the scientific jury. I see that an application with examples of varieties of rank scales is available.

I have the following questions:

1. How is rank scale data aggregated?
2. Can you give an example of a process template and its application in software development processes?
3. Can you give an example of the stageisn template and variants of its application in an IT company?

IV. Conclusion

I believe that PhD student Svetoslav Ivanov has shown skill in developing independent scientific research on the scale of a dissertation. The PhD student is able to work with the latest achievements in informatics and to express a personal opinion.

As a member of the scientific jury for awarding the educational and scientific degree "Doctor" I give my positive assessment of the readiness of the candidate Svetoslav Ivanov to acquire the educational and scientific degree "Doctor" in professional field 3.8 "Economics", doctoral program "Application of computing in economics".

01.12.2022
Varna

Sincerely:

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679

/Julian Vassilev/



OPINION

1. General information

Prepared the opinion: Assoc. prof. Petya Emilova Popova, PhD, Department of Business Informatics at the D. A. Tsenov Academy of Economics – Svishtov, professional field 05.02.08 „Application of Computing in Economics“.

Grounds for writing the opinion: order of Vice-Rector for Research at the University of Economics – Varna № РД-06-190/08.11.2022, on an open procedure of the defense of the dissertation.

Author of the dissertation: Svetoslav Stefanov Ivanov - PhD student in professional field 3.8. "Economics", doctoral program "Application of Computing in Economics" at the Department of Informatics at the University of Economics – Varna.

Topic of the dissertation: " Managing the Development, Maintenance and Support of Software from Technology Startup Companies".

2. General presentation of the dissertation

The presented dissertation has a volume of 164 pages and contains a list of used abbreviations, an introduction, an exposition in three chapters, a conclusion, a list of used literature and Internet sources, a list of publications on the topic of the dissertation, as well as an appendix. The scientific problem is explored in 145 pages and illustrated with 13 figures and 15 tables. The bibliography includes - a list of the literature used with 140 literary sources, of which 16 are in Bulgarian and 16 Internet sources. The dissertation is presented in a form and volume corresponding to the requirements and criteria for such developments. In its entirety, the dissertation is well structured and balanced.

3. Publications and participation in scientific forums

In the list of publications on the dissertation, the candidate has indicated three articles, of which two are independent and one co-authored with the supervisor, five reports, of which three are independent and two reports, again co-authored with the supervisor.

4. Assessment of the form and content of the dissertation

The scientific research presented in this dissertation is dedicated to current topics related to the management of the production and support of software products in technological start-up companies. The solution of the five *tasks* defined by the author is subordinated to *the goal*, which is – to develop a software system design that, applied with an appropriate process management approach, will successfully support the operations of technology start-up companies. The study used a variety of *approaches and methods* such as systematic approach, comparative and economic analysis, systematization (classification and typification), induction and deduction, modelling, and scientific abstraction. The three main parts (chapters) of the dissertation are logically consistent and well balanced in terms of volume and content.

In the introduction of the dissertation the author argues the relevance of the topic, precisely defines the main thesis, purpose, tasks, subject, and object of research.

The first chapter has a theoretical character and examines the nature and characteristics of technology start-ups; some methodological problems related to the development of software products are investigated; the peculiarities of software project management, as well as different approaches to software development management in this type of company.

In the second chapter, the author's conceptual and logical model of a software system, managing the main processes and activities in the development, maintenance, and support of software for technology start-up companies, is presented. In this case, the author proceeds from the fact that small companies are characterized by a lower degree of formalization, simplified procedures, and rules.

In the third chapter of the dissertation, which is of a practical-applied nature, based on the model developed in the second chapter, the processes of building and using the software development management system in the company "BitPioneers Black Sea" Ltd. are presented.

The conclusion presents the research, the conclusions and generalizations that prove the author's thesis.

The attached abstract of 39 pages relevantly reflects the content and structure of the dissertation.

5. Scientific and scientific-applied contributions of the dissertation

The presented dissertation contains scientific and applied contributions. Its structure and content comply with the requirements of the Rules for the development of the academic staff at the University of Economics – Varna.

I accept the contributions indicated in the contribution report. From a theoretical point of view, the peculiarities of the start-up technology companies developing software, their

definition, management, and organization of the activity have been studied. Methodological issues related to business organization and management approaches suitable for technology start-ups are also explored. In a practical-applied aspect, a conceptual and logical model of the software system has been developed for technological start-up companies developing software; a practical plan for implementing the software system is proposed; software technologies are argued to be used depending on the size of the software project being implemented by a technology start-up; and the software tools are summarized, with the potential for use in the individual stages of the process of creating software in a virtual environment.

The appropriate language, the logical exposition, as well as the illustration of the exposition and the conclusions with schemes and diagrams make a good impression.

6. Confirmed or unconfirmed plagiarism in the dissertation and the abstract

I have not found any plagiarism or incorrect reference to foreign works in the dissertation work and the abstract of Svetoslav Stefanov Ivanov.

7. Critical remarks and recommendations

I have no significant comments or recommendations for the presented PhD thesis.

8. Questions on the dissertation

A tech start-up's ecosystem includes multiple and diverse components. Which of them can play a critical role during the different stages of development?

9. Summary assessments of the dissertation and conclusion

In conclusion, we express a positive opinion about the dissertation of Svetoslav Stefanov Ivanov, which is an independent study of a topical and significant problem, both for the theory and above all for the practice of business information systems. The dissertation contains the necessary scientific and scientific-applied contributions and meets all the requirements and criteria for awarding the educational and scientific degree "Doctor". This gives us reason to give a positive assessment of this procedure.

8.12.2022

Svishtov

Signature: ..

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679

(Assoc. Prof. P. Emilova, PhD)



OPINION

Вх. №

ПА 20 - 1483 / 12.12.2022г.

by **Assoc. Dr. Rosen Ivanov Kirilov** - member of the scientific jury, for **the acquisition of the educational and scientific degree "doctor"** according to the procedure announced by the University of Economics - Varna

1. General information.

1.1. Prepared the statement: Associate Professor Rosen Ivanov Kirilov, PhD, Department of Informatics, University of National and World Economy - Sofia.

1.2. Basis for writing the opinion: Order RD No. 06-190 / 08.11.2022 of the Vice-Rector for NIDRC of the University of Economics - Varna for the appointment of a scientific jury and Decision from the first meeting of the Scientific Jury dated 11.11.2022 .to appoint a chairman and reviewers.

1.3. Author of the dissertation: **Svetoslav Stefanov Ivanov** . The doctoral student graduated in informatics at the University of Economics - Varna (OKS "Master"). He studied in a full-time doctoral course in the field of higher education 3. Social, economic and legal sciences, professional direction 3.8. Economics, scientific specialty "Application of computing technology in the economy" at the Department of Informatics.

1.4. Topic of the dissertation work: "Managing the development, maintenance and support of software by technology start-up companies".

2. General presentation of the dissertation work.

The dissertation work submitted to me for opinion is 164 pages long, structured in an introduction, three chapters, a conclusion, used literature (140 sources, of which 120 are in Bulgarian and the rest in a foreign language), Internet sources and an appendix. The exhibition includes 13 figures and 15 tables.

3. Publications and participation in scientific forums.

On the topic of the dissertation, 3 articles and 5 reports from scientific conferences are presented. From the information provided, it is clear that there is compliance of the candidate's publications with the quantitative requirements under Art. 35, para. 1, items 1-4 of the Regulations for the development of the academic staff at IU-Varna. In addition, there is compliance with the minimum national requirements for awarding the educational and scientific degree "doctor", according to Art. 2b, para. 2 and para. 3 of the Law on the Development of the Academic Staff in the Republic of Bulgaria. The candidate has proven the availability of 50 points.

4. Assessment of the structure and content of the dissertation.

The **introduction** presents some of the current trends and relevance of the researched topic. Some new concepts are introduced, such as FinTech, InsurTech, EdTech, MedTech/HealthTech, FoodTech, BioTech, AgroTech, PropTech, CleanTech/GreenTech, etc. The author has indicated the research thesis, the purpose of the dissertation work, the main



tasks, the object and subject of research, the methodological basis of the research and its limitations. The **first chapter** examines technology start-ups. Their features are presented, which lead to features of software creation processes as well. A literature study was carried out with the derivation of the conceptual apparatus and terminology used. Some new and modern concepts related to this type of enterprise are also introduced here. Particularly interesting is the need to implement a new business model. The clarification of the concepts used in the study makes a very good impression (pages 16-18). The features of the software project management process in such companies have been clarified. **The second chapter** examines the conceptual and logical model of the software production management system in technology start-up companies. Attention is paid to the information modeling of the system with business components. A very good impression is made by the part that gives suggestions for improving the regulatory framework. **The third** chapter presents the process of building and using the software development management system in BitPioneers Black Sea Ltd. This part clarifies the activity of the analyzed company and its features. Attention has been paid to some organizational aspects and the peculiarities of system operation.

The dissertation contains scientific and scientific-applied results. They represent an original contribution to science and show that the candidate has serious theoretical knowledge in the scientific specialty. In addition, abilities to conduct independent scientific research have been proven. The dissertation is presented in the required form (according to the normative requirements of the University of Economics - Varna), with high lexical and stylistic characteristics. It presents a theoretical approach to solving a significant real practical problem.

The abstract correctly reflects the structure, content and contributions of the dissertation work. A total of eight publications on the topic of the dissertation are presented to it - 3 articles and 5 reports from scientific conferences.

5. Identification and assessment of scientific and scientific - applied contributions in the dissertation work.

I accept the defined contribution moments in the dissertation work. I would recommend combining some of them. This will allow the achievement of a more complex approach to the application of the results of the dissertation work in practice.

6. Detected or undetected plagiarism in the dissertation and abstract.

No plagiarism was found in the candidate's dissertation and abstract.

7. Critical notes and recommendations.

My critical note is mainly related to the filled concepts in relation to the qualification of software specialists. Page 71 mentions their skills. Along with them, however, it is correct to indicate the knowledge and professional competences of the employees. This is particularly important from the point of view of the application of different competence assessment systems.



8. Questions for the dissertation student.

The following questions can be asked:

- 8.1. What cybersecurity measures do technology start-ups implement in their operations?
- 8.2. Can the proposed logical model be used in other types of organizations and under what conditions?

9. Conclusion.

In conclusion, I believe that the dissertation work submitted to me for an opinion meets the requirements of the Law on the Development of the Academic Staff (LAD), the Regulations for the Implementation of the LAD, as well as the internal documents of the University of Economics - Varna. Relevant scientific and scientific-applied contributions can be identified in it. I express my general **positive assessment** and recommend to the established scientific jury to award the educational and scientific degree "doctor" in the scientific specialty "Application of computing technology in the economy" to **Svetoslav Stefanov Ivanov**.

Sofia
09.12.2022

Prepared the opinion:
/ Associate Professor Rosen Ivanov Kirilov, PhD/

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679