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ТЕХНИЧЕСКИ УНИВЕРСИТЕТ
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ВАРНА

REVIEW

by competition for the occupation of the academic position "Professor"
by professional area 5.13 General engineering,
study discipline "Production Management",
announced in SG No. 2/05.01.2024

Candidate: Assoc. Prof. Dr. Eng. Tanya Pencheva Panayotova

Reviewer: Prof. Dr. Siyka Dimitrova Demirova

1. General and biographical data

The competition for the occupation of the academic position "Professor" was announced for the needs of the Technical University-Varna in the "State Gazette", issue 2/05.01.2024 under professional direction 5.13 General Engineering, study discipline "Production Management". Only one candidate participated in the competition – Assoc. Prof. Dr. Eng. Tanya Pencheva Panayotova.

Assoc. Dr. Eng. Tanya Pencheva Panayotova was born in 1961 in Varna. She completed hers secondary education at the Technical College of Economics "G. Rakovski", city of Varna in 1980. In 1994 obtained a Master's degree in "Technology of Mechanical Engineering and Metal Cutting Machines", and in 2005 became a Doctor in the scientific specialty "Organization and Production Management" with a dissertation on the topic "Modeling of organizational relationships in the development of complex project tasks in conditions of Competitive Engineering".

Since 1994 until now, she has successively held the positions of "assistant", "principal assistant" and "associate professor" at the Technical University - Varna. In the period 2016-2020 she is a Head of the "Industrial Management" department and from 2023 she is a Head of the Doctoral Center at TU - Varna.

She is the owner and manager of the consulting studio "Renita Expert" Ltd, Varna in the field of business evaluation, investment design and business planning. She holds certificates of appraiser competence from the Chamber of Independent Appraisers in Bulgaria for Commercial Enterprises and Receivables, Industrial and Intellectual Property Rights, Machinery and Equipment, Real Estate, Agricultural Land and Perennial Plantations. She is an expert is at the Registration Agency-Varna.

2. General description of the presented materials

The submitted documents for the competition include information on participation in projects, supervision of doctoral students, work with students, membership in professional organizations, participation in scientific juries, realized mobilities and contribution to furnishing a laboratory in the Department of Industrial Management.

For her participation in the competition, Prof. Dr. Eng. Tanya Panayotova presented a total of 36 scientific papers (including 1 monograph), 1 textbook and 2 teaching aids. The seven publications on the dissertation for the acquisition of the ESD "Doctor" and the presented scientific works for the competition for the academic position "Associate Professor" are not reviewed.

The publication activity for the for the occupation of academic position "Professor" are divided into the following groups:

- Monograph - 1 pc.

- Scientific publications that are referenced and indexed in world-famous databases with scientific information - 2 pcs.

- Scientific publications in peer-reviewed journals or in edited collective volumes - 33 pcs.

- Published university textbook - 1 pc.

- Published university textbook - 2 pcs.

Order of participation in the publications:

- 12 publications are independent, incl. the monograph;
- in 14 publications she is the first author;
- in 10 publications she is the second author.

By language of writing:

- in Bulgarian - 19 pcs. incl. the monograph;
- in English - 17 pcs.

For participation in the competition, a list of citations is presented, including:

- citations or reviews in scientific publications, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes - 90t.
- citations in monographs and collective volumes with scientific review - 18points;
- citations or reviews in non-refereed peer-reviewed journals - 48 points.

For the period from 2008 to date, Assoc. Prof. Dr. Eng. Tanya Panayotova has participated in eight national scientific and educational projects. She was a manager at five.

Assoc. Dr. Eng. Tanya Panayotova has presented a certificate for participation in 21 scientific juries, was a reviewer in two international scientific forums, one textbook and one teaching aid.

She has carried out two mobilities for the purpose of teaching at Vilnius Gediminas Technical University, Lithuania in 2017 and in Centria University of Applied Sciences, Finland in 2019. In 2010 she visited the European Parliament in Brussels and participated in a debate on the topic: "Problems of increasing competitiveness in the industry of the EU and Bulgaria".

In conclusion, I believe that the submitted materials for the competition satisfy the minimum national requirements and those of TU-Varna for occupying the academic position "Professor".

3. General characteristics of the candidate's research and scientific-applied activity

The main focus of the candidate's research and applied scientific activity is in the areas of: production and operational management – 10 publications, engineering of industrial enterprises – 9 publications and competitiveness of industrial enterprises – 17 publications. The textbook and the two manuals are also in the field of the announced competition.

The general characteristics of the candidate's research and scientific-applied activity correspond to the requirements for occupying the academic position "Professor".

4. Assessment of the candidate's pedagogical training and activity

Assoc. Ph.D. Eng. Tanya Panayotova has extensive pedagogical experience. She has been working with students since 1994. According to the presented report on the study load during the last three academic years, she conducted classroom study activities at the Bachelor's College of Education, 1,344.8 hours of lectures, 81 hours of laboratory exercises, 15 hours of seminar exercises and 60 hours of course project, and the conducted outside the classroom educational activity is 277.8 hours. In the "Bachelor" ELL, the candidate reports 39.2 hours. Tanya Panayotova, Associate Professor, Dr. Eng., conducted 218 hours of lectures at the Master's University of Applied Sciences.

It is clear from the reference for developed study programs by disciplines that the candidate is the author of more than 30 books. study programs in "Bachelor" and "Master", among which the disciplines of the current competition stand out.

He is the scientific supervisor of over 30 graduate students and a reviewer of 19 diploma theses in "Bachelor", BLL, "Master", BLL and "Bachelor", ALL.

Associate Professor Tanya Panayotova, PhD, Eng., is the initiator and organizer of a student competition in "Management". On her initiative, Peter Simon, regional manager of ABB Group for Romania, Bulgaria and Moldova (2007-2013), gave a series of open lectures to students of TU-Varna.

For the quality assurance of the students' classes from the specialties "Industrial Management" and "Technological Entrepreneurship and Innovation", in 2017. Assoc. Prof. Tanya Panayotova provides over BGN 11,000 in donation support for equipping a laboratory room with computer configurations and an integrated EnterpriseOne®Online information system.

Assoc. Prof. Tanya Panayotova is the supervisor of two successfully defended doctoral students and five more at various stages of their studies.

I evaluate the candidate's pedagogical training based on the activities reflected in his creative resume and works related to this activity. Bearing in mind the presented report on the study load, I accept that the pedagogical training and teaching activities of Assoc. Prof. Tanya Panayotova are at a high professional level and are directly related to the subject of the competition.

5. Basic scientific and scientific-applied contributions

Assoc. Prof. Tanya Panayotova presents a monograph entitled "Investigation of the impact of intellectual capital on the value of the industrial enterprise" for participation in the recruitment competition for AP "Professor". The work is developed in three chapters:

- Chapter One clarifies the questions regarding the application of the value approach in company management. The VBM concept (Value Based Management) in enterprise management, criteria for implementing the value approach in the corporate management system were selected, the concept of "intellectual capital" and its structure were clarified.

- Chapter Two contains theoretical and methodological aspects of the value approach. Its essential characteristics are clarified and the prerequisites for value creation are derived. In a logical sequence, an analysis of the situations creating value in the company is made and the possible approaches used for business evaluation are indicated. Further, the intellectual capital as a source of value for the company is examined, a connection is made between the VAIC and EVA concepts, and a general concept of the value creation process is built, specifying the sources of value.

- Chapter Three offers a methodology for applying the value approach in the management of the industrial enterprise. An algorithm for implementing the value approach in the management of the corporation is proposed, with the main phases and steps in the methodology being described in detail.

I believe that structured in this way, the monograph completely exhausts the issues related to the impact of intellectual capital on the value of the industrial enterprise. The proposed algorithm is absolutely applicable and has its scientific and scientific-applied weight.

Regarding the rest of the works submitted for participation in the competition for hiring AP "Professor", the contributions contained in them can be grouped into the following main areas:

- production and operational management of industrial enterprises - D.7.1, D.7.2, D.8.1, D.8.2, D.8.10, D.8.21, D.8.25, D.8.30;

- engineering of industrial enterprises - B.3.1, D.8.1, D.8.6, D.8.7, D.8.9, D.8.17, D.8.18, D.8.22, D.8.27, D.8.32;

- competitiveness of industrial enterprises - C.3.1, C.7.1, C.8.1, C.8.4, C.8.8, C.8.10, C.8.14, C.8.15, C.8.16, C.8.19, C.8.20, C .8.21, D.8.24, D.8.26, D.8.28, D.8.29.

A Hypothesis. It has been theoretically proven and actually verified by practice that organizational forms of competitive engineering can adapt conventional engineering components in the process of their development, as hybrid solutions, but with increased efficiency. The conducted research proves the manifestation and presence of this methodological component in the development stages of competitive engineering. (D.8.1, D.8.6, D.8.7, D.8.18, D.8.22, D.8.32, E.24.2)

1. Scientific contributions

1.1. Based on an in-depth analysis of the main characteristics of the market environment, the need for a new, advanced concept for the construction and operation of the production subsystem has been established in order to increase the competitiveness of the enterprise and the challenges that stand in the era of Industry 4.0. (D.7.1, D.8.1, D.8.4, D.8.10)

1.2. The method of Interpretive Structural Modeling (ISM), Structural Interaction Matrix (SSIM) and Analytical Hierarchy method are considered to study the relationship between factors and their impact on production capacity planning and management. (D.7.2, D.8.1)

1.3. New concepts and approaches are proposed and theoretically justified, which ensure increasing participation of customers in the creation of added value - " Mass Customization ", "Co- Creation ", " Customer Order Decoupling Point / CODP", " Prosumer 7", etc. The CODP concept has been proven to be a useful project management tool for planning and executing individual customer orders, and according to the CODP position, the customer is "allowed to walk in" through the operational process using various selection options within the CODP itself. (D.8.21, D.8.23)

1.4. The use of methods and techniques such as the project structure matrix (DSM) is proposed with improvements made in the approach regarding the interpretation of the types of tasks in the development of a model that helps to determine the places in the process of the implementation of the project to be realized together with the client. (D.8.21.) 1.5. It has been proven that CODP positioning options have a direct impact on the definition of the enterprise's operational strategy, and in addition - on the organization and management of production processes in its units. As a result of summarizing the various approaches and existing methods for solving the problem, the Analytic Hierarchy Method (AHP) is proposed in solving such a problem. (D.7.1)

1.6. The development of Competitive Engineering (CI) has been tracked and its development guidelines have been systematized as a complete complex integrated process. Special attention is paid to new software products and their compatibility with the requirements of modern production realities, such as digitization, artificial intelligence and virtual reality. (D.8.9, D.8.32)

1.7. Based on an in-depth analysis of theoretical positions and world experience, it has been proven that the company, as a center of interests, must satisfy the requirements of multiple groups of interested persons and, from this point of view, balance between short-term and long-term goals. The assessment of value is essential not only for the development of the individual enterprise, but also for the directions and growth rates of each industry and the economy as a whole. The main components to be managed are growth and return on invested capital. (Q.3.1)

1.8. A conceptual model of the interaction between the economic value added (EVA) and the value added by intellectual capital (VAIC) models is proposed. (B.3.1, D.8.3)

2. Scientific and applied contributions in the field of production and operational management of industrial enterprises

2.1. A methodology for identifying the key factors and the dependencies between them is proposed, which classifies them into 4 main groups such as independent, dependent, interdependent and driving. (D.8.1)

2.2. An experimental model and an algorithm for its application are presented for evaluating the competence of production managers in response to a real practical need, set as a research task by the business. The research was conducted using the Delphi method . On this basis, the index of competence of experts in the field of production management was determined. (D.8.2)

2.3. The Real-Time Enterprise (RTE) concept is explored and a model is proposed for its implementation in the field of manufacturing, which provides a comprehensive framework for the control of production processes. (D.8.10)

2.4. An approach based on the principles of modularity is used, which can be applied to successfully implement the CSRP concept for resource planning synchronized with the needs of the customer Synchronized Resource Planning - CSRP). The approach is based on the method known under the name "Modular network design"/"Modular network design" (Modular Network Design - MND) and focuses attention on making auxiliary decisions and solving organizational problems, through a decision system (Decision Support System – DSS). The MND-method and DSS serve the process of searching for the best alternative. (D.8.25)

Scientific and applied contributions in the field of engineering of industrial enterprises

2.5. A model of the design process using Queuing Theory is proposed. (D.8.18)

2.6. Proposed and analyzed are the methodological approaches for implementing organizational management engineering such as: reengineering of business processes; knowledge engineering; system of balanced indicators; reengineering of external processes (X-engineering). (D.8.17)

2.7. The network approach in the engineering of company management processes is proposed. In this sense, the different types of business networks (Businessnetwork BN) have been examined and clarified, and a formal model for BN reengineering has been proposed , which would support the development of integrated and long-term relationships between individual enterprises in a given business network. (D.8.6, D.8.7)

Scientific and applied contributions in the field of competitiveness of industrial enterprises

2.8. A methodology has been developed for the application of the value approach in enterprise management (C.3.1)

2.9. An interaction model has been developed in order to provide an environment and opportunities for intelligent specialization in Varna. (D.8.8)

2. 10. A cross model of concepts such as Strategic Map, "Four P's of Creativity", Crowdsourcing , Personal and Collective Intelligence is presented for strategic mapping of creativity. The model is applicable to enterprises that are able to provide the necessary financial resources and human staff and whose business is based on production with intensive generation of new ideas. (D.8.1)

2.11. A modified version of T. Forbes ' model for evaluating brand strength is proposed (Brand Strength Analysis), which allows the license fee to be positioned at the appropriate place within the permissible limits of fluctuation. (D.8.15, D.8.16)

2.12. A review of the Bulgarian innovation system was carried out, which review takes into account the existing large disparity between the regions in Bulgaria. It has been established

that the previous studies (mainly at the national level) and the general recommendations made do not sufficiently take into account some specific features of the SIR economy. It is proposed that the disparities between the regions be reduced through intelligent industrialization in certain directions. The main conclusions are drawn and based on them, strategic guidelines for the development of the innovation policy are proposed. (D.8.19)

2.13. A conceptual model of the task setting for the selection of key performance indicators, the regular monitoring of which determines progress in terms of achieving the company's goals, is proposed. (D.8.20)

2.14. The possibility of applying the main results of knowledge engineering, namely the formulation of a specific strategy for effective knowledge management, was explored. Solutions are presented related to how the organization acquires knowledge from the experience, skills of associates and other sources and how the accumulated intellectual potential is used to increase the efficiency and adaptability of the company. (D.8.29)

2.15. The TRIZ Method is proposed, which is based on the study of examples/models of problems and their resolution, and not on the spontaneous and intuitive creativity of a given person or group. (D.8.28)

3. Applied Contributions

3.1. It has been researched that the innovation activity that takes place in the workplace can be a source of effective solutions for saving energy and resources, as well as for improving the functioning of the physical working environment. Areas for improvement have been analyzed, including the physical working environment and related factors creating a risk to the health of workers, dictated by the need to create more quality jobs in industrial enterprises. (D.8.24)

3.2. Analyzed and systematized the main activities and events, taking into account the relationship workplace - productivity and competitiveness, which must be taken into account already at the stage of designing the industrial enterprise. The requirements for the design of production enterprises, regarding the implementation of high-performance methods of work, ensuring greater uniformity of the worker's movements and actions, the avoidance of unnecessary and irrational movements, as well as the possibilities for achieving this, were examined. The factors influencing the rational design of workplaces and their service are reported. (D.8.26)

3.3. The Bulgarian context of the globalization and internationalization of higher education was examined, using the example of TU-Varna. The main directions for improving the activity of TU-Varna in order to increase its competitiveness and attractiveness are outlined. (D.8.12)

widespread program product EXCEL is proposed and, more specifically, its extension SOLVER, which uses the program for nonlinear optimization General Reduced Gradient (GRG2) as a way of calendar planning. The specific task of preparing an optimal schedule of the staff's working and rest days for a certain period of time has been solved. (D.8.30)

3.5. An investment selection method was applied when evaluating the business case in a given project, which shows the attractiveness of the project and its benefits for the sponsoring organization. The analysis is illustrated with examples from the practice of business valuation. (D.8.27)

After my thorough acquaintance with the works of Assoc. Prof. Tanya Panayotova, I can state that I accept all the contributions presented by her. They refer to the following groups: *proving with new means essential new aspects of already existing scientific fields, problems, theories, hypotheses and obtaining confirmatory facts.*

The citations of the works submitted for use by AP "Professor" are reflected in the Reference for the minimum national requirements. It shows that 66 points were collected from citations in monographs and collective volumes with scientific review and citations in non-refereed peer-reviewed journals.

6. Significance of contributions to science and practice

I accept that the scientific, scientific-applied and applied contributions contained in the works of Assoc. Prof. Tanya Panayotova are her personal work and are of essential importance for the development and enrichment of scientific research in the field of production management, engineering and competitiveness of industrial enterprises.

7. Critical notes and recommendations

I have no significant critical notes with which to dispute the main scientific, scientific-applied and applied contributions of Assoc. Prof. Tanya Panayotova.

My recommendation is that the methodology proposed in the monograph be used for testing in order to solve the practical problem involved in the development and prove the validity of the research.

8. Personal impressions and opinion of the review

I personally know Assoc. Prof. Tanya Panayotova. She has all the qualities of a built and active researcher and teacher. She is fair with her colleagues, with whom she has scientific contacts and scientific disputes, and respects the opinion of her scientific opponents. Uses modern management skills in scientific development.

CONCLUSION

Based on my familiarity with the presented scientific works, their importance, the scientific, scientific-applied and applied contributions contained in them, **I find it reasonable to propose Assoc. Prof. Dr. Eng. Tanya Pencheva Panayotova to occupy the academic position of "Professor" in professional direction 5.13 General engineering, study discipline "Production management".**

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