REVIEW

by **Ivan P. Popchev**, academician at BAS

of dissertation work for awarding of the educational and scientific degree **"Doctor"**

in the professional direction 5.3 Communication and computer technologies

Doctoral program " Computer systems and technologies "

Titled " Design of a Compensation System for Management Executives using

Generalized Nets"

by **Alexsander Janusz Kacprzyk, M. Sc., MBA**

By order No. УД-71-А/20.05.2020, of the Rector prof. Magdalena Mitkova, PhD in accordance with the Act of Development of the Academic Personnel of the Republic of Bulgaria (ADAPRB) and in connection with the decision of the Faculty council of the Faculty of Technical Sciences I have been appointed an external member of the Scientific Jury for defense of the dissertation of Alexsander Janusz Kacprzyk for the educational and scientific degree "doctor" in doctoral program "Computer systems and technologies" in professional direction 5.3. Communication and computer technologies.

In assessing the dissertation work, the terms of the ADAPRB, The Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (RIADAPRB), (Decree No. 56/2018) and the Rules of the University "Prof. d-r Assen Zlatarov" for the implementation of the Act and therefore will be accurate delivered:

1. According to art.27 (1) of the ADAPRB "the dissertation work shall contain scientific or applied research results, which offer original contribution to science. The dissertation work shall show the candidate's profound theoretical knowledge on the respective subject, as well as their ability of independent scientific research."

2. According to art.27 (2) of the RIADAPRB the dissertation work should be presented in type and volume corresponding to the specific requirements of the primary unit. The dissertation work should contain: a title page; contents; introduction; presentation; conclusion - summary of the obtained results, accompanied by an originality declaration; bibliography.

According RIADAPRB the minimum required points by groups of indicators for "Doctor" are:

Group of indicators	Content	Number of points
A	Indicator 1	50
G	Sum of indicators from 5 to 11	30

According to Europass Education Spectrum (1991 – 2001) of Aleksander J. Kacprzyk includes: Master on Finance and Banking – Warsaw School of Economics (1996), Master of Science in Management – University of Minnesota and Warsaw School of Economics (1996), Master of Business Administration – Massachusetts Institute of Technology – Sloan School of Management, Cambridge, MA (2001).

Respectively, the work experience of the applicant starts from: 1996 and passes successively through Consultant (McKinsey and Company), Investment Director (Enterprise Investors), Director – Central European Buyouts (The Carlyle Group), Investment Committee Member – Media 3.0 Innovation Incubator (MMC brainville.pl – Wyzsza Szkola Biznesu – National Louis University), Corporate Finance Lecturer, MBA Program for Healthcare professionals (Lazarski University) and Managing Pertner (Resource Partners).

Undoubtedly, the high level of academic education and work experience are determining and motivating factors, both for the formation of the purpose of the dissertation and for the final results obtained.

The scientific supervisors of the dissertation are: Corr. Member Prof. Krassimir Atanassov, DSc, DSc and Prof. Bratoy Koprinarov, PhD.

The goal of the dissertation thesis is "first, to propose a new model for the design of an executive compensation system in various types of companies, private, and public, smaller and larger, with a concentrated and dispersed ownership, using the powerful tool of Generalized Nets (GNs) (p.4).

This is of a crucial importance because the model is meant for use by domain experts in economics, management science, human resources, etc. with a limited knowledge of mathematics. (p. 8)."

The dissertation is in volume of 152 pages and includes:

- Introduction (**Chapter 1**, 3 – 10);
- Management Compensation as a Critical Problem in Highly Competitive Business Conditions (**Chapter 2**, 11 – 22);

- Introduction to the Theory of Generalized Nets (**Chapter 3**, 22 – 62);
- A New Model for the Determination of Management Compensation Using Atanassov's Generalized Nets (**Chapter 4**, 63 – 91);
- An Example of Management Compensation Determined by Using the New Generalized Nets Model (**Chapter 5**, 92 – 121);
- Concluding Remarks and Possible Future Direction of Research (**Chapter 6**, 122 – 125);
- Author's Publications Related to the Dissertation Thesis (126 - 127);
- Declaration for Originality of the Results (128);
- Glossary of Terms (129 – 137);
- List of Tables (138);
- List of Figures (139);
- Bibliography (140 – 152).

Nine papers have been published in the dissertation:
- 1 publication is in journal with IF and SJR [No. 6];
- 1 publication is in journal, indexed in Scopus [No. 4];
- 3 publications are in other journals [NNo. 5, 7 и 8]
- 3 publications are in conference proceedings [NNo. 1, 2 и 3];
- **7 publications are co-authored;**

No citations were noted.

The requirements of the RIADAPRB and the University "Prof. Assen Zlatarov " rules are fulfilled.

In summary, the **results obtained** are an enrichment of existing knowledge and can be summarized as follows:

1. The use of Generalized Nets for the design of executive compensation, which is one of very important problems faced by business in all countries and of many types of ownership, has proved to be successful. The Generalized Nets nave made it possible to formally present many aspects and relations of this

inherently dynamic, asynchronous and parallel process, and thay provide algorithms which are numerically efficient.

2. An informal introduction to the Generalized Nets theory was given with the aim to be suitable for economists, human resource managers and other relevant domain experts.

3. A Generalized Nets model of executive compensation system design was constructed and applied to two real Polish companies, and the executive compensation packages, as determined at the output of the GN-model, were compared against the existing alternatives and have shown to be better and the results obtained have been very positively evaluated by domain experts.

Critical notes

1. The dissertation lacks a "conclusion - summary of the results obtained" according to the rules in Art. 27 (2) ADAPRB, and instead of "bibliography" is "used literature" and the declaration of originality is not on the dissertation page.

2. The bibliography has some incompleteness in a number of sources such as missing: ISSN or ISBN, year of release, publisher and pages.

3. A requirement has been introduced to understand the model for use by experts with limited knowledge of mathematics (p. 8) and calculations (p. 12 B). The limits of "limited knowledge of mathematics and calculations" are not defined.

4. Publication No. 7 of the "Author's publications related to the dissertation thesis" has nothing to do with the purpose and results of the dissertation. Only on page 125 is it written: "In a longer perspective, it can be interesting to use elements of the Markov chain (cf. Kacprzyk, Tomov and Atanassov [65])".

Questions on dissertation work:

1. Following the statement (p. 27) that two main classes are relevant (cf. Cassanros and Lafortune [41]): automata and Petri nets, why are only network models accepted in the dissertation?

2. The constructed general network model is applied in two real Polish companies. What are the possibilities and limitations for this model to be applied in companies in other

countries? Are there any preliminary hypotheses, for example for applicability in Bulgarian companies?

3. As future developments (p. 125) are marked: Intercriteria Analysis (ICA), Intuitionistic Fuzzy Sets (IFSs) and Index Matrices (IMs). What are the resources needed (including financial and human resources) to create design models from the perspective of economists, organizational and management sciences, human resources and other experts? Do these experts have to have "limited knowledge of mathematics and calculations"?

4. Why is the dissertation not proposing the introduction of hardware and/or software tools even in the future developments, which may follow from the professional direction 5.3 itself?

The abstract is in Bulgarian and English in volume 32 pp., and presents the dissertation thesis.

Alexsander J. Kacprzyk is a member of: Area Representative for Poland of MiT Alumni Association – since 2015; Educational Counselor for Massachusetts Institute of Technology – since 2012; Mentor in Social Business Accelerator of Polish Venture Capital Association – since 2018.

CONCLUSION

The dissertation work follows the requirements of the ADAPRB, RIADAPRB and the University "Prof. d-r Assen Zlatarov" rules for implementation of the Act.

I give a **positive conclusion** for the acquisition of the educational and scientific degree "Doctor" to **Alexsander Janusz Kacprzyk**.

I **propose that the Scientific Jury unanimously vote on Alexsander Janusz Kacprzyk the educational and scientific degree "Doctor" professional direction 5.3 Communication and computer technologies, Doctoral Program "Computer Systems and Technologies".**

24.06.2020

Подпис заличен
Чл.2 от ЗЗЛД

Signature:

Acad. Ivan P. Popchev