



## REVIEW

Bx. № PD 20-33 / 10.01.2022

by Prof. Dr. Julian Andreev Vasilev,  
Varna University of Economics,

Professor in PN 4.6 "Informatics and Computer Science", validated in the register of the academic staff of NACID "Habilitation persons with scientometric indicators";

Member of the scientific jury for the academic position "Professor" in a competition announced by the University of Economics - Varna (UE-Varna)

### I. Reason for writing the review

Order of the Rector of UE-Varna RD 06-182 / 06.12.2021 for determining the composition of the scientific jury; held the first meeting of the scientific jury on 17.12.2021

### II. Contest data

The competition was announced in the field of higher education 4 "Natural Sciences, Mathematics and Informatics", professional field 4.6 "Informatics and Computer Science", scientific specialty "Informatics"; for the needs of the Faculty of Informatics and the Department of Informatics at the University of Economics - Varna. An announcement was published in SG no. 85 / 12.10.2021

### III. Candidate for the competition

The only candidate in the competition is Assoc. Prof. Dr. Snezhna Dineva Sulova. She was born in 1973. She holds a diploma of ONS "Doctor" 30572 / 12.06.2006 from the Higher Attestation Commission. He holds a certificate for the academic position of "Associate Professor" of the University of Economics - Varna (D023 / 13.07.2012). She has held the academic positions of "Assistant" (2006-2008), "Chief Assistant" (2008-2012), "Associate Professor" (2012 to date). Apart from the University of Economics in Varna, she has worked as a system administrator and programmer. She has participated in scientific juries, editorial boards of journals, program and organizational committees of conferences, expert in expert groups at NEAA, member of the Board of TT of NTS Varna.

The candidate Assoc. Prof. Sulova covers the minimal national requirements (described in the PPZRASRB) and the minimum university requirements (MUI) for a "professor" in PN 4.6. According to certain criteria, the candidate's points exceed the minimum several times.

**Table 1.**

**MNR for "professor" in PN 4.6 according to ZRASRB and MNR of Assoc. Prof. Sulova (points)**

Indicator	MNR according to ZRASRB	MNR of Assoc. Prof. Sulova
A	50	50
B	-	-
V	100	100
G	200	402
D	100	296
E	100	515

**Table 2.**

**Minimum University Requirements (MUR)**

No	Indicators	MUI for "Professor"	Points of Assoc. Prof. Snezhana Sulova
1.	Scientific reports	60	100
2.	Scientific articles and studies	115	127.5
3.	Publications in Scopus and / or Web of Science	30	195
4.	Cited in Scopus and / or Web of Science	15	495
5.	Defended by doctoral students	40	80
6.	Research projects (participation and / or management)	15	310

**IV. Content characteristics of the presented works**

Assoc. Prof. Sulova participated in the competition for "professor" with **45 publications**, incl. 3 monographs, 2 studies, 13 articles, 18 conference papers, 9 textbooks.

Table 3.

## SUMMARY TABLE OF PRESENTED PUBLICATIONS

№	Type of publications	Independent		Co-authored		Total	
		Count	Page	Count	Page	Count	Page
1.	Monographs	1	175	2	58	3	233
2.	Studies	1	25	1	13	2	38
3.	Scientific articles	10	128	3	16	13	144
4.	Conference papers	14	105	4	26	18	131
5.	Textbooks	-	-	9	504	9	504
6.	Other publications	-	-	-	-	-	-
	<b>Total:</b>	<b>26</b>	<b>433</b>	<b>19</b>	<b>617</b>	<b>45</b>	<b>1050</b>

Table 4.

## SUMMARY TABLE FOR VOLUME AND TYPE OF PRODUCTION

№	Type of publications	For participation in the competition for professor		Total <sup>1</sup>	
		Count	Page	Count	Page
1.	Monographs	3	233	4	263
2.	Studies	2	38	4	145
3.	Scientific articles	13	144	20	222
4.	Conference papers	18	131	35	239
5.	Textbooks and teaching aids	9	504	12	816
6.	Other publications	-	-	1	55
	<b>Total:</b>	<b>45</b>	<b>1050</b>	<b>76</b>	<b>1740</b>

According to the requirements of ZRASRB, PPZRASRB and the Rules for development of the academic staff in UE-Varna, the candidate for the academic position " professor " must meet the following conditions.

- To have acquired ONS "Doctor". *Assoc. Prof. Sulova meets this condition. She defended her dissertation at the Higher Attestation Commission in 2006. The topic of her dissertation is "Building a system for information support of e-business".*

<sup>1</sup>The column Total includes all publications of Assoc. Prof. Dr. Snezhana Salova - on the topic of the dissertation, in the competition for "Associate Professor" and in the competition for "Professor".

- To have held the academic position of "Associate Professor" for at least 2 years. *The applicant meets this condition. Assoc. Prof. Sulova holds the academic position of Associate Professor since 2012 (Number and date of appointment: RD-17-2027 / 13.07.2012).*
- To present a published monographic work. *The candidate has published an independent monograph "Sulova, S. 2021. Extraction of knowledge and analysis of data from Internet sources, Monographic Library "Prof. Tsani Kalyandzhiev", book 77. ISBN 978-954-21-1082-8".*
- To correspond to the MNR for the academic position of "professor". *The applicant covers the MNR.*
- To meet the minimum university requirements. *The candidate covers MUR.*
- No established plagiarism indicated. *No plagiarism found. The works with which he participates in the competition have passed a plagiarism test and a peer review process before being published.*
- To have at least one defended doctoral student. *Assoc. Prof. Sulova has two PhD students.*

The monographic (Habilitation) work with which she participated in the competition (*Sulova, P. 2021. Extraction of knowledge and analysis of data from Internet sources, Monographic Library "Prof. Tsani Kalyandzhiev", book 77. ISBN 978-954-21- 1082-8*"), is an independent monographic work; it was discussed in the primary unit (Department of Informatics), reviewed by two habilitated persons, published in a specialized scientific publishing house, has an ISBN, has extensive content; has a comprehensive bibliography, does not repeat already known knowledge; brings a significant scientific problem to a high scientific level; as a volume is 153 pages.

Assoc. Prof. Snezhana Sulova has a profile on Scopus. Scopus has 14 publications, 47 citations, h-index: 4.

Assoc. Prof. Snezhana Sulova also has profiles in WoS, Scholar Google, ORCID, RePEc, CEEOL and Research Gate. Many of her publications are visible in full text.

All publications of Assoc. Prof. Snezhana Sulova have been entered in the Register of Publications of the University of Economics - Varna.

The publications with which he participated in the competition were not used to hold a previous academic position.



## **V. Learning work**

**Snezhana Sulova** has conducted classes in the following disciplines: Informatics, Internet Technologies, Office Applications, Logical and Functional Programming, Introduction to Informatics, Web Technologies, Client Web Programming, Interactive Design and Applied Programming, E-Business (English language), Informatics (Russian language), Diploma seminar.

**Snezhana Sulova** has conducted classes in the following disciplines: E-Business Part 1, Internet Sales, Management Information Systems, E-Business, Web Technologies, Web Technologies (English), Business Analysis and Knowledge Extraction, Technologies in digital marketing, Computer technology in advertising and media communications, Search engine optimization, Java Script programming.

For Erasmus students: Web technologies, UX Design.

In the last school years there is a full class workload.

Assoc. Prof. Snezhana Sulova participates in the preparation of a number of curricula. In recent months she has been actively involved in the preparation of the curriculum and qualification characteristics of the specialty "Data Science" (in the Bachelor's degree; PN 4.6).

## **VI. Contributions, citations**

The following contributions stand out in the habilitation work on the competition:

1. The research of the existing approaches for extracting knowledge from Internet sources has been made, the used methods for working with different types of Internet resources have been established and the necessity of developing a unified model for extracting knowledge and analyzing data from Internet sources has been proved.
2. A reasonable proposal has been made for the dynamic use of heterogeneous data sources and the integration of structured unstructured data in the extraction and analysis of data from Internet sources.
3. A model for extracting knowledge and analysis of data from Internet sources has been developed, which is consistent with the specifics and

diversity of data on the Internet and allows flexible application of different approaches to analysis.

4. Technological solutions for the implementation of the model for knowledge extraction and data analysis from Internet sources are proposed.
5. The model for extracting knowledge and analyzing data from Internet sources - e-shop and social network - has been tested.

In the other publications can be highlighted additional contributions related to:

1. Defining the principles of data selection in the online environment.
2. Frameworks for digital big data processing have been developed.
3. A prototype for big data processing in logistics has been proposed.
4. A methodology for evaluating e-commerce websites has been developed.
5. Approaches to text mining and data mining have been developed in a number of areas.

Assoc. Prof. Snezhana Sulova has a total of **110 citations**. References to citations are made correctly - autocitations are not included. The reference to citations in Scopus, declared by the author, created on 01.12.2021, shows 37 citations. Currently (as of January 10, 2022) the citations are already 47. A fact that shows the visibility and significance of the publications of Assoc. Prof. Snezhana Sulova.

## **VII. Critical remarks, questions and recommendations**

Assoc. Prof. Snezhana Sulova has two successfully defended doctoral students - Ch. Assistant Professor Dr. Boris Bankov and Chief Assistant Professor Dr. Radka Nacheva. He is currently the research supervisor of Dr. Slavka Stamenova. I recommend Assoc. Prof. Sulova to continue working with PhD students. To include doctoral students and students in their work on research projects.

I recommend continuing to publish research results and real experiments. On the positive side, I acknowledge her efforts to find a suitable application of informatics in various areas of business.

I recommend that you continue to participate in Erasmus mobility; to continue to participate in projects and lead projects.

### VIII. Conclusion

Careful review of all documents and publications of the candidate **Assoc. Prof. Dr. Snezhana Dineva Sulova**, submitted for participation in the competition for the academic position of "**professor**" in PN 4.6, show that all the requirements of ZRASRB, PPZRASRB and the Regulations for the development of the academic staff at the University of Economics-Varna are met. The candidate meets the minimum national and university requirements for holding the academic position of "**professor**" in PN 4.6 at the time of announcing the competition.

I give my positive opinion on the readiness of the candidate **Snezhana Dineva Sulova** to take the academic position "**Professor**" of the University of Economics Varna in professional field 4.6 "Informatics and Computer Science", scientific specialty "Informatics".

January 10, 2022.  
City. Varna

Sincerely,

  
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/Julian Vasilev/

**REVIEW**

in a competition for the academic position of *professor*  
in the field of higher education *4. Natural sciences, mathematics and informatics*,  
professional field *4.6. Informatics and computer science*,  
specialty "*Informatics*",  
for the needs of the Department of Informatics at the University of Economics – Varna with  
candidate **Assoc. Prof. Snezhana Dineva Sulova, PhD**

The review is prepared by **Prof. Maria Petkova Hristova, PhD** member of the scientific jury, determined by order RD 06-182 of the Rector of the University of Economics – Varna from 06.12.2021, according to the announced in the State Gazette, issue 85/12.10.2021, competition for the academic position "Professor" in the professional field 4.6. "Informatics and Computer Science", scientific specialty "Informatics" and the decision of the scientific jury of 17.12.2021 in accordance with the requirements of Art. 2, para. 5 of the Regulations for the implementation of the Law for development of the academic staff in the Republic of Bulgaria (PPZRASRB) and art. 83 of the Regulations for the development of the academic staff in the University of Economics – Varna (PRASIU).

The review is in accordance with PPZRASRB and PRASIU and is based on the documents submitted for participation in the competition by the only candidate – Assoc. Prof. Snezhana Dineva Sulova, PhD from Varna University of Education. As a member of the scientific jury, I received all of the 17 documents on the list.

**1. Personal characteristics of the candidate**

Assoc. Prof. Snezhana Dineva Sulova, PhD graduated from the University of Economics – Varna in 1996 with a master's degree in economics and computer science. In 2006, after defending a dissertation on "Building a system for information provision of electronic business" she received the degree of "Doctor" in the scientific specialty "Application of computing technology in economics". She holds a diploma for an educational and scientific degree from the High Attestation Commission. Since 2006, she has been an assistant professor in the Department of Informatics, and since 2012 she has been an associate professor in PN 4.6 "Informatics and Computer Science (Informatics and Electronic Business)". Prior to that, she worked as a programmer at IDIS Varna and system administrator at Navibul Holding AD. She has a qualification in "Pedagogy", obtained at the "University of Economics" – Varna.

**2. Quantitative and substantive characteristics of the presented scientific works after the last procedure**

During the examination of the documents, it is determined that Assoc. Prof. Snezhana Dineva Sulova, PhD satisfies the requirements of the normative documents and fully covers the science metric criteria provided for holding the academic position of "professor".

I would especially like to note the extreme precision with which the documents for the competition are prepared.



According to Art. 77 item 3 of PRASIU – Varna (in force from 01.07.2021) the candidate in the competition for professor is required to have submitted a “published **monograph** or equivalent publications (in the professional fields where this is acceptable according to PPZRASRB) in a specialized scientific publishing house, which should not be the same as those for obtaining the educational and scientific degree “Doctor”, the scientific degree “Doctor of Science” and for holding the academic position “Associate Professor”. Assoc. Prof. Snezhana Sulova, PhD presented an **independent monograph** “*Knowledge Extraction and Analysis of Data from Internet Sources*”, published in the Monographic Library “Prof. Tsani Kalyandzhiev”, book 77. ISBN 978-954-21-1082-8, Publishing house “Science and Economy”, University of Economics – Varna, 2021. The monograph corresponds to ZRASRB, Additional Directives, item 10. (New, SG No. 30/2018), in effect from 04.05.2018. The paper consists of 175 pages, is well structured with an introduction, 5 chapters, a conclusion and bibliography of 203 sources, over 170 of which are in English. It was examined in advance in a specialized primary unit and was reviewed by two habilitated persons.

The introduction formulates the *thesis of the monograph* as: the need to create a model for using data from Internet sources to support analytical processes in organizations and contribute to making adequate business decisions in the context of dynamics and globalization. *The purpose* of the study is to propose a model for knowledge extraction and data analysis from various Internet sources, which would allow the application of flexible approaches to the implementation of the process and integrated data use. To achieve this goal, four *main research tasks* have been set, for the solution of which the author has applied the comparative, historical, systematic and complex approach, the methods of logical and statistical analysis, as well as *the* methods of information modelling.

The first chapter “*The Internet environment as a source of data*” is dedicated to the theoretical aspects of the Internet as a source of data and the types of data on the World Wide Web have been identified. The second chapter “*Approaches to extracting knowledge from Internet sources*” provides an overview and analysis of the available ways to extract knowledge from the Internet. The approaches for extracting knowledge from the content, structure and usability of Internet sources are considered. It is concluded that there is a need to develop a unified model for data analysis from Internet sources, which would allow data integration and construction of flexible and dynamic schemes and approaches for analysis. In the third chapter “*A model for knowledge extraction and analysis of data from Internet sources*” a model is proposed, which corresponds with the characteristics and diversity of data on the Internet. The created conceptual framework allows the use of different approaches and architectural solutions for data organization. The fourth chapter “*Software tools for extracting knowledge from Internet sources*” is devoted to the research and analysis of software technologies for the implementation of the model for extracting knowledge and data from Internet sources. The requirements to them are defined and an approach for the realization of the model is proposed. The application of the model is demonstrated in Chapter Five, using data from the e-shop and extracted data from social networks. Through the approbation performed with the general-purpose software product RapidMiner Studio, it was proved that the acquired new knowledge helps significantly with the management decision-making processes and generally improves the competitiveness of companies. The

conclusion summarizes the main contributions in the monograph. The graphic part of the work makes a very good impression – over 60 figures and tables, and 4 applications.

The language of the monograph is on a high professional level, the text is clearly written and with correct punctuation. This is valid for all papers submitted for review by Assoc. Prof. Sulova.

The candidate has submitted a list of a *total of 75 publications*, including: 8 monographs and studies; 20 articles; 35 reports; 12 textbooks and practical textbooks.

Assoc. Prof. Snezhana Sulova, PhD participated in the competition with *45 publications* (5 monographs and studies, 13 articles, 18 reports, 9 textbooks and practical textbooks). All requirements for the number of scientific papers have been repeatedly exceeded. The entire production of the candidate is thematic in the competitive professional field 4.6 Informatics and Computer Science. None of the works repeats the publications presented in the defence of the educational and scientific degree "Doctor" and for the academic position "Associate Professor". Therefore, all assets are included in the final evaluation in this competition.

**The publications under Art. 86 (5), item 2 of PRAS in the University of Economics – Varna** are as follows:

- There are *3 monographs* (one independent – the monographic work), *and the extended articles – 2* (one independent).
- *The scientific articles are 13, 10 of them are independent.* The publications are in prestigious journals and publishing houses such as: International Journal of Computer Networking, Wireless and Mobile Communications (IJCWMC); TEM Journal – Technology, Digital Transformation, Education, Management; Informatics/Association for Information Communication Technology, Education and Science, Novi Pazar, Serbia; Cyber Security and Resilience of Modern Societies, Cham: Springer International; Serdica Journal of Computing, Sofia; Institute of Mathematics and Informatics – BAS; Izvestiya of the University of Economics – Varna, Science and Economics; Izvestiya of the Union of Scientists – Varna. Economic Sciences Series; Vestnik Udmurtskogo Universiteta: Matematika Mekhanika Komp'yuternye Nauki, Izhevsk: Udmurt State University and others.
- *The scientific reports are 18 (14 independent).* They have been presented at conferences in Bulgaria and abroad and have been published in conference proceedings: CompSysTech'19: 20th International Conference on Computer Systems and Technologies, University of Ruse; New York: ACM, CompSysTech'20: Proceedings of the 21st International Conference on Computer Systems and Technologies '20, Association for Computing Machinery; CompSysTech '21; Jubilee Scientific Conference “Challenges to Information Technologies in the Context of Horizon 2020”, Svishtov: Academic Publishing House “D. A. Tsenov”; Proceedings of the International Scientific Conference “Trends and Challenges in Economic Development” – Varna: Publishing house Science and economics; International Scientific and Practical Internet Conference, Dnepropetrovsk, Ukraine: Dnipropetrovsk State Financial Academy; 17th International Multidisciplinary Scientific Geo conference SGEM 2017, Albena, 2017,18 and others.
- Textbooks and practical textbook – 9, all in the field of the competition. There is one edition in Russian and 3 in English.

Separation protocols are presented for all co-authored works. I don't have any doubt in the candidate's significant personal contribution to the work.

From the list of publications, a total of **35 (24 individual) publications** are included in indexing, referencing and evaluation systems, including publications from the national reference list maintained by NACID, Scopus and/or Web of Science. According to references about the publications in Scopus and WoS, **14 of the publications are indexed in Scopus / WoS**, 6 of which are stand-alone. There are also references to publications included in RePEc Author Service, CEEOL, Google Scholar, ResearchGate and others.

17 of the publications are in English, 2 – in Russian, the rest – in Bulgarian.

The applicant has attached a declaration of originality, which states that “the information provided in connection with the competition is reliable and prepared in accordance with the requirements of ZRASRB and the rules on the terms and conditions for obtaining degrees and academic positions at UE – Varna”. That the submitted monograph and the publications attached to it are the personal work of the applicant, and that the copyright requirements regarding the sources used are met. There is no plagiarism proven by the statutory order in the works submitted for evaluation.

### **3. Quantitative and qualitative assessment of the teaching activity**

The teaching activity of the candidate Assoc. Prof. Snezhana Sulova, PhD is rich and significant.

According to the presented report, her pedagogical activity is defended with lectures and laboratory exercises in key disciplines of the professional field 4.6. There are 8 courses for Bachelor's degree, incl. one in English and one in Russian: *Informatics, Internet technologies, Office applications, Logical and functional programming, Introduction to informatics, Web technologies, Client web programming, Interactive design and application programming, E-business (English), Informatics (Russian), Graduation Seminar*. For ACS “Master” there are 10 courses, incl. one in English: *E-Business Part 1, Internet Sales, Management Information Systems, E-Business, Web Technologies, Web Technologies (English), Business Analysis and Knowledge Extraction, Digital Marketing Technologies, Computer Technologies in Advertising and Media Communications, Search Engine Optimization, Java Script Programming*.

For Erasmus students, Assoc. Prof. Sulova teaches courses in *Web technologies* and *UX Design*. Her international teaching activities include teaching under the Erasmus + program at the Kyiv National University of Trade and Economics (KNUTE), Ukraine (2019) and studying under the same program at the University of Szczecin, Poland (2018).

According to the presented report, the work load of the candidate in the 2020/2021 academic year is 305 hours of lectures for Bachelor's degree and 270 hours of lectures for Master's degree in cat. “Informatics” as well as a work load of 36 hours with students studying at the Center for Vocational Training in “Pedagogy”. All this shows the need for the announced competition for the professor's position.

For the period 2012-2021 Assoc. Prof. Snezhana Sulova, PhD was a advisor of a thesis or master's thesis of 41 students and a reviewer of 13 master's theses. She is the research advisor of five doctoral students, two of whom have successfully defended their doctoral programs in Informatics.

She participates in the organization and conduct of the annual reviews of student research, as well as in the organization of the annual Olympiad for students. Since 2013, Assoc.



Prof. Sulova has actively worked on 8 projects with students and PhD students, mostly on projects "Student Internships".

According to the reports for work on curricula, the candidate participated in the development of 13 curricula in computer science disciplines for a Bachelor's degree and 12 for a Master's degree, published on the web page of the Department of Informatics on the website of University of Economics – Varna. She participates in the development of two disciplines in the doctoral program "Informatics" and two disciplines in the doctoral program "Application of computer technology in economics". She also develops curricula for an Erasmus+ Bachelor's degree in *User Experience Design* and *Web Technologies*.

The pedagogical activities and teaching and methodological contributions of Assoc. Prof. Sulova should include her participation in the co-authorship of textbooks, practical textbooks and other teaching materials (all published by the University Publishing house "Science and Economics"): the textbook *Informatics*, Varna: (8 authors) (editions 2013, 2017, 2019); *Business intelligence of the company*. (Electronic textbook); *E-business part 1*. (Electronic textbook); *Training materials in the specialty "Informatics" for master's degree part 1*, *Electronic Business 1st Part*, *Business Modelling Analysis and Development of Business Information Systems*. Science and Economics, *Internet technologies*; *Guide for the preparation for a national competition in informatics*. Assoc. Prof. Sulova maintains courses with teaching materials in all disciplines taught by her in the platform for electronic and distance learning e-learn at the University of Economics – Varna.

All textbooks and teaching materials are written professionally and are useful teaching aids for students in the disciplines of *Informatics*, *Electronic Business*, *Business Analysis and Knowledge Extraction*, *Internet Technologies* and more. They are of interest to a wider range of specialists.

***I give a high mark to the pedagogical activity of the candidate***, which fully meets the requirements of Art. 77, item 2 in connection with Art. 86 of the Regulations for the development of the academic staff at the University of Economics – Varna.

#### **4. Identification of the contributions of the research**

Based on the works of the candidate Assoc. Prof. Snezhana Sulova PhD, several main topics in her research interests can be distinguished: *Extraction of knowledge, processing, analysis and use of data from Internet sources*; *Solving problems in digital data processing*; *E-business and e-commerce*; *Application of data mining and text mining techniques in various business activities and sectors of the economy*.

**The scientific, scientifically-applied and applied contributions can be classified according to** the indicated thematic areas and research methods as follows:

4.1. A significant part of the candidate's work in the competition and her contributions are related to the extraction of knowledge, processing, analysis and use of data from Internet sources, and the monographic work is of paramount importance [1].

In point 2 the monographic work "*Knowledge Extraction and Analysis of Data from Internet Sources*" was evaluated. The main contributions of the work claimed by the author can be accepted. They come down to:

1. The existing approaches for extracting knowledge from Internet sources and methods for working with different types of Internet resources are evaluated. There is a justified need to



develop a flexible, unified model for knowledge extraction and analysis of data from Internet sources.

2. A dynamic use of heterogeneous data sources and integrating structured and unstructured data in the extraction and analysis of data from internet sources is proposed.

3. A flexible, unified model for knowledge extraction and analysis of data from internet sources has been developed.

4. Instruments for the realization of the model for extracting knowledge and analyzing data from Internet sources are analyzed and suitable software tools have been proposed.

5. The approbation of the model for an e-shop and a social network has been made.

The contributions with numbers 1,2,3,4 can be considered as *scientifically-applied*, and contribution 5 – *applied*.

Some of the contributions to this monograph can be found, albeit in slightly different editions, in other works of the candidate: monograph [2] (“Intelligent analysis of student data”), studies [4] (available in Scopus) (an approach to automated analysis of a static set of data extracted from user messages for holiday resorts published on Twitter is proposed) and stand – alone articles [7], [8], [9], [15]. Article [17] proposes an approach to organizing and storing different types of data, based on the combined use of the concepts of data lake and data repository. The approach allows the storage of large amounts of data, regardless of their type, structure or format, as well as the integrated use of structured and unstructured data and the application of a variety of smart business analysis techniques. In [25] the main tasks and methods of the analysis of feelings and moods (Sentiment analysis – SA) are analyzed and classified. In [26] (Scopus) an approach based on a natural language processing technology is proposed to improve and automate the process of organizing and classifying scientific papers. The methods of controlled machine learning and two algorithms for text classification Support Vector Machines (SVM) and Naive Bayes (NB) are applied. The approach has been tested with over 200 publications published in the last four years in the magazine “Izvestiya” of University of Economics – Varna. Reports [27] (available in Scopus) as well as [29], [30], [35] discuss and solve problems such as: automatic analysis of customer opinions in online stores; application of the extraction of knowledge from Internet sources in the management of customer relations, improving the process of grouping and processing of scientific publications, etc.

All of the contributions above are *scientifically-applied*.

#### **4.2. Solving problems in digital data processing**

The contributions in papers: monograph [3], and articles [5], [31] by their nature are also *scientifically-applied*. Problems related to the innovative digital processing of existing and emerging new types of data in the construction and logistics sectors are defined in the works. Frameworks for innovative digital processing have been developed and a prototype for big data management and processing in these sectors has been proposed, which is useful for building concepts that would help organizations in the overall process of transformation and digitalization of their business processes.

#### **4.3. Developments in the field of e-business and e-commerce**

Papers [6] and [28] (independent in Scopus) propose a methodology for evaluating e-commerce websites, based on a system of indicators obtained as a result of data from: expert assessments, databases of electronic shops, analytical data systems extracted from internet sources. The proposed methodology is essential for improving the processes of customer

relationship management and other marketing activities. The revenues from commercial activities depend on them.

In another group of publications, the research and analysis have been on the development of specialized software tools for the development of e-shops. In [10] the most popular software solutions of this type are analyzed – the platforms Magento Open Source, PrestaShop, OpenCart, ZenCart, Drupal Commerce, Spree Commerce, WooCommerce, Jigoshop, VirtueMart, Ubercart and osCommerce and the main trends in their development are indicated. In [24] the main aspects of the choice of software for e-commerce are extracted and analyzed. The classification of e-commerce software platforms has been made and recommendations have been made on their applicability (in the textbooks for the disciplines “Electronic Business”, “Business Modelling” and “Analysis and Construction of BDS”) [39] [40] [41]). The contributions to the works of this group are scientifically applied and applied.

#### **4.4. Developments about the application of data mining and text mining techniques in various business activities and sectors of the economy**

*The scientifically-applied contributions* in this section are related to the development of approaches for the application of *data mining* and *text mining* techniques. Article [11] (stand-alone in Scopus) proposes a way to differentiate and create user groups by processing data from the use of an e-commerce website, as well as an approach to identifying the visited web pages. The extraction and processing of their textual content is based on the technology of natural language processing and the use of methods for clustering text documents. In [13] and [27] (independent in Scopus) an analysis and evaluation of e-shop customers is made, based on data mining methods, e.g. in [13] for the purposes of the analysis a decision tree is built, which helps in making rational management decisions. In [14] (independent in Scopus) an approach is proposed for extracting interesting dependencies of data about human resources in an organization and the use of the obtained results in the selection of teams for work on software projects is proposed.

The contributions and achievements in this thematic class include: studying and creating mental models of consumers [16] (Scopus); analysis of data from social networks for tourist destinations [4]; detection of spam emails [19]; grouping and classification of research publications – [26], [35] (Scopus); analysis of the similarities of text documents [23].

#### **Reflection of the candidate's scientific publications in our and foreign scientific literature**

The candidate submitted a list of 110 open citations (excluding self-citations) in Bulgarian and foreign scientific literature. Many of the citations are made by foreign scholars in prestigious journals such as: *Journal of Software*, *International Journal of Business Process Integration and Management*, *Journal of Innovation Management*, *Journal of Advanced Computer Science and Applications (IJACSA)*, *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, *Korean Journal of Applied Statistics*, *Brazilian Journal of Technology*, *International Journal of Computer Applications*, *Journal of Al-Qadisiyah for Computer Science and Mathematics*, *International Journal of Innovative Computing*, etc. This is further evidence of the high professional level of the developments and their international visibility. From the attached references it can be seen that in Scopus the **h-index is 4**, and in WoS **h-index – 1**.

The number of citations repeatedly exceeds the requirements of the Quantitative requirements for holding the academic position of “professor” at the University of Economics – Varna on the basis of Art. 2b, para. 5 of ZRASRB. The required number of points there is at least 15, and those declared by the candidate are 555. According to the Reference for the implementation of the minimum national requirements for the academic position of “professor” in higher education 4. “Natural Sciences, Mathematics and Informatics”, according to art. 2b, para 2 and 3 of ZRASRB with the necessary in group E indicators (citations) 100 points, the candidate has 296 points.

Assoc. Prof. Sulova has participated in 14 research projects, 5 of which he is the leader of, including one international project – “Digitization and preservation of the documentary history of University of Economics – Varna as part of the cultural and historical heritage of the academic community in Bulgaria” Contract № 24-10-M2-6 /24.04.2015, under the BG08 program “Cultural Heritage and Contemporary Arts”, partner: Regional Library – Oppland, Norway, 2015-2016).

She has taken participation as an expert-researcher in the following projects: “Digitalization of the economy in the environment of Big Data (BIG)” 2018-2023, funded by the Operational Program “Science and Education for Smart Growth”, the projects “Student Internships” funded by OP “Human Resources Development” – 2007-2013, 2014-2015; “Modern approaches to the integration of mobile technologies in higher education”, 2019-2021; “Social media in business and education”, 2017-2018 and others. With this, the candidate earns 295 points on the indicator “Research projects” of the “Quantitative requirements for holding the academic position of “Professor at the University of Economics – Varna”, exceeding the required 15 points by many times.

### **Significance of the contributions to science and practice**

Based on the general characteristics of the scientific, scientifically applied, applied and educational-methodological contributions of the candidate, it can be concluded that the contributions are important for science, practice and the educational process. Proof of their importance are the many and authoritative citations. The contributions are the personal work of the candidate or are the result of teamwork with her leading participation and have an academic importance for the development of the professional direction of the competition at the University of Economics – Varna.

### **5. Literary awareness**

Assoc. Prof. Snezhana Sulova, PhD is a highly erudite lecturer and researcher, well acquainted with the current state of science in her field – an impression confirmed both by the literary sources cited in the works and by the level of the works which meet the high modern criteria, as well as by her membership in authoritative creative and professional organizations in the field of the competition.

### **6. Additional information**

Assoc. Prof. Sulova has administrative experience gained as Deputy Head of the Department of Informatics. She is a member of the attestation commission at the Faculty of Informatics at the University of Economics – Varna and a participant in scientific juries for dissertation defences.



She is a member of the Union of Scientists – Varna and a member of the Board of Directors of the Scientific and Technical Unions – Varna. Participates as an expert in expert groups at the Standing Committee on Natural Sciences, Mathematics and Informatics at NEAA.

She is a member of organizational and program committees of scientific conferences: International Scientific Conference “Information Technology in Business and Education”, dedicated to the 45th anniversary of the Department of Informatics at the University of Economics – Varna, 2014; Information and Communication Technologies in Business and Education International Conference, dedicated to the 50th anniversary of the Department of Informatics, 2019; 15th International Conference, BDAS 2019, Ustron, Poland; 7th International Conference on Computer Science and Information Technology (CoSIT 2020), Zurich, Switzerland; International Conference on Data Science and Cloud Computing (DSCC 2020), Dubai, UAE.

#### **7. Critical remarks and recommendations**

- There is no summary of the candidate's achievements from all her publications in the Scientific Contributions Report. The summary would present the candidate more comprehensively and vividly, if it is structured by thematic-object feature, and not by types of works.
- Given her potential as an experienced and erudite teacher, the candidate could be more active in her outgoing international teacher mobility.

These recommendations and observations do not call into question the significant results stated in the candidate's work and do not impair the positive impression of the results in the scientific production of the candidate in the competition.

#### **8. Personal impressions of the candidate**

As a member of the Standing Committee on Natural Sciences, Mathematics and Informatics at NEAA, I know Assoc. Prof. Snezhana Sulova, PhD from her participation in the accreditations of doctoral programs at Sofia University “St. Kliment Ohridski” and the University of Veliko Tarnovo “St. Cyril and St. Methodius”. I have excellent personal impressions of the professionalism, depth and sense of responsibility in the work of Assoc. Prof. Sulova.

### **CONCLUSION**

The documents and materials presented by Assoc. Prof. Snezhana Dineva Sulova, PhD meet the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the implementation of ZRASRB, the minimum national requirements for holding the academic position “professor”, according to Art. 2b para. 2 and 3 of ZRASRB; The Regulations for development of the academic staff of University of Economics Varna and the requirements for holding the academic position of “professor” at the University of Economics – Varna on the basis of Art. 2b, para. 5 of ZRASRB. The applicant satisfies all the indicators of these requirements, and most of them significantly exceed in terms of quantity.

The entire research and teaching activity of Assoc. Prof. Sulova, PhD is related to problems and specific tasks in the field of the announced competition and characterizes the candidate as a scientist with high professional qualification and erudition, as well as a university

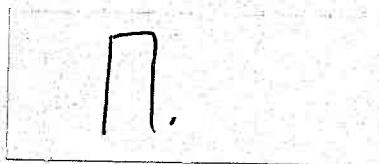


lecturer with extensive professional experience in the 4.6 Informatics and Computer Science professional field.

All this gives me a reason to give my completely positive assessment of the submitted materials and I propose to the Scientific Jury to vote a proposal to the Faculty Council of the Faculty of Informatics at the University of Economics – Varna to elect Assoc. Prof. Snezhana Dineva Sulova, PhD to the academic position “Professor” in the professional field 4.6 “Informatics and computer science”.

January 25, 2022

Reviewer:

A rectangular box containing a handwritten signature in black ink. The signature consists of a stylized capital letter 'M' followed by a period, representing 'M. Hristova'.

/prof. Maria Hristova, PhD/

**VARNA UNIVERSITY OF ECONOMICS**

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**REVIEW**

**by a member of the scientific jury for the academic position “Professor”  
in a competition announced by the University of Economics – Varna**

**1. General information**

The review was prepared by: Prof. Evdokia Nikolaeva Sotirova, PhD University “Prof. Dr. A. Zlatarov” – Burgas.

Grounds for writing a review for the competition: Order № RD 06-182 of the Rector of the University of Economics – Varna from 06.12.2021 for the appointment of a scientific jury and a decision from the first meeting of the scientific jury on 17.12.2021.

This review has been prepared in accordance with the Law for the development of the academic staff in the Republic of Bulgaria (ZRASRB), the Rules for the Implementation of ZRASRB and the Rules for the Development of the Academic Staff at the University of Economics – Varna.

**2. Information about the competition**

The competition is announced in the field of higher education: 4. Natural sciences, mathematics and informatics in the professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”, for the needs of the Department of Informatics, Faculty of Informatics at the University of Economics – Varna.

Number and date of the State Gazette in which the respective announcement was published: 85/12.10.2021

The presented set of materials and documents for participation in the competition is in accordance with Art. 80. (1) of the Regulations for the development of the academic staff at the University of Economics – Varna.

**3. Candidates in the competition**

The only candidate in the competition for the academic position of “professor” is Assoc. Prof. Snezhana Dineva Sulova, PhD.

Assoc. Prof. Snezhana Dineva Sulova, PhD was born on August 21, 1973 in the town of Nova Zagora. She graduated high school in 1991 at Hristo Botev High School – Nova Zagora. In 1996 she graduated with a master's degree in economics and computer science from the University of Economics – Varna. In 2006 she obtained the educational and scientific degree “Doctor” in the scientific specialty “Application of computing technology in economics” from the Higher



Attestation Commission for a defended dissertation on the topic “Building a system for information provision of electronic business”.

The work experience of the candidate began with her being a programmer at “IDIS” AD, Varna (1996 – 1998), then a system administrator in “Navibul Holding” AD, Varna (1998-2001). Assoc. Prof. Sulova started teaching in 1999 as a part-time assistant at the University of Economics – Varna. In 2006 she became an assistant, and in 2008 – chief assistant professor at the same university. Since 2012 she has held the academic position of “Associate professor” in the professional field 4.6 “Informatics and Computer Science” in the Department of Informatics, Faculty of Informatics, University of Economics – Varna.

The total number of publications of Assoc. Prof. Snezhana Sulova is 63, of which 3 are monographs (1 independent, 2 co-authored), 1 chapter of a monograph; 4 extended articles (3 independent, 1 co-authored); 21 articles in magazines and periodical issues (18 independent, 3 co-authored); 34 papers in conference proceedings (25 independent, 9 co-authored). 45 of these are independent, which shows that the scientific achievements of the candidate are largely her personal work. Assoc. Prof. Sulova is the author or co-author of 10 textbooks (1 independent, 9 co-authored), and 2 practical textbooks (1 independent, 1 co-authored). All the candidate's works are in editions included in the national reference list maintained by the National Center for Information and Documentation. A report with a total of 110 citations was presented.

Assoc. Prof. Snezhana Sulova has worked on 14 research and educational projects. She has participated in initiatives for raising her qualification and she has acquired an additional qualification in the specialty “Pedagogy”. She has been involved in the organization of a number of activities related to students and doctoral students: an annual Olympiad for students, annual reviews of student research, advising graduates and others. She has been an advisor to 5 doctoral students, two of whom successfully defended their dissertations. She has participated in the Erasmus+ program for teaching purposes. This is an indication of professionalism and proves the candidate’s desire to develop and improve her skills.

#### **4. Quantitative and substantive characteristics of the submitted scientific papers after the last procedure**

Assoc. Prof. Snezhana Sulova is participating in the competition with 36 scientific publications, 8 textbooks and 1 practical textbook.

The scientific publications, are distributed as follows:

- 1 monograph (habilitation monograph), 2 co-authored collective monographs,
- 2 extended scientific articles (1 independent and 1 co-authored),
- 13 scientific articles (10 independent and 3 co-authored),
- 18 scientific papers in conference proceedings (14 independent and 4 co-authored).



The scientific papers submitted for participation in the competition have not been used to obtain the educational and scientific degree “Doctor” and to hold the academic position of “Associate Professor”, no plagiarism has been detected and all are reviewed.

**4.1. Fulfillment of the national requirements for holding the academic position “professor” in the professional field 4.6. Informatics and computer science**

According to the Information attached by Assoc. Prof. Snezhana Sulova for fulfillment of the minimum national requirements for holding the academic position “Professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”, she is participating in the competition with 14 scientific publications with a total volume of 310 typewritten pages. They are as follows:

- 1 monograph (habilitation monograph) (175 typewritten pages);
- 12 scientific publications in issues referenced and indexed in Web of Science or Scopus (105 typewritten pages). 11 of the publications have the SJR factor [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11], 2 are in quartile Q 3 [1, 5], 2 are in quartile Q 4 [3, 6]. 6 of the publications are independent ;
- 1 collective monograph (participation of the candidate with 30 typewritten pages).

All presented scientific papers are directly related to the professional field 4.6 Informatics and Computer Science, scientific specialty Informatics.

The candidate's monograph titled “Knowledge extraction and analysis of data from Internet sources” deserves special attention. In compliance with the Regulations for the development of the academic staff at the University of Economics – Varna, it was discussed at a meeting of the Department of Informatics, reviewed by two habilitated persons, published in the specialized scientific publishing house “Science and Economics”, University of Economics – Varna.

The monograph consists of an introduction, 5 chapters, a conclusion, used literature from 203 sources. The aim of the author is to propose a model for extracting knowledge and for analyzing data from various Internet sources, which allows the integrated use of data and the application of flexible approaches to their processing. The characteristic features and diversity of data on the Internet and the introduction of the idea of finding appropriate technological solutions and approaches for their processing are presented in Chapter I. “The Internet environment as a source of data”. Chapter II. “Approaches to extracting knowledge from Internet sources” justifies the need to develop a unified model for the analysis of data from Internet sources, which would allow the integration of data and the construction of flexible and dynamic schemes and approaches for analysis . The proposed model is described in Chapter III. “A model for knowledge extraction and analysis of data from Internet sources”, and it allows the use of different approaches and architectural solutions for data organization and allows for cyclical repetition of processes and the search for models in data from Internet sources. In Chapter IV. “Software technologies and tools for the realization of the model for knowledge extraction and analysis of data from Internet





*sources*” the software tools for knowledge extraction are analyzed, the factors for choosing a specific solution are identified and the RapidMiner Studio software product is selected to test the developed model. *Chapter V. “Application of the model for knowledge extraction and analysis of data from Internet sources”* demonstrates the application of the model for surveying customer satisfaction from e-commerce and an analysis of opinions for tourist destinations recorded from the social network Twitter by using different algorithms for processing and transforming data into new knowledge.

I believe that the work is well structured, competently presented and illustrated. Bearing in mind the diverse information sources in the global network, the dynamic development of mobile and web technologies, as well as the interdisciplinary nature of the subject area, I am convinced of the high level of usefulness of the proposed model, providing a comprehensive framework for managing and processing of knowledge extraction and the analysis of data from Internet sources. It would be very interesting for me to apply the proposed model to data related to the higher education system. I believe that such an application can be easily integrated in the study of the quality of education, the scientific activity of the academic staff, etc. and this would be useful for optimizing and improving these processes.

The other publications of the candidate are related to the approaches to processing unstructured data, algorithms for their analysis, data knowledge extraction, the application of algorithms from the field of artificial intelligence and can be summarized as follows:

- publications [1], [4], [7] and [8] – approaches to data processing related to e-commerce are presented;
- publications [2], [3], [5], [6], [11] and [12] are aimed at the application of natural language processing techniques, text mining technologies, the classification and clustering of data, associative rules and their application for knowledge extraction in various fields of knowledge;
- publication [9] is related to the modeling of a self-learning and adaptive real-time analysis system;
- publication [10] presents a system for evaluating universities in the context of internationalization through publicly available information visible on their websites;
- the author's participation in the co-authored monograph is related to the analysis of the possibilities for the application of digitalization in the construction and logistics sectors.

According to the attached reference, Assoc. prof. Sulova is participating in the competition with 37 citations of 8 of her publications in scientific publications of other authors, indexed in world-famous databases of scientific information.

Assoc. Prof. Sulova has been an advisor to two PhD students who have successfully earned PhDs in the professional field 4.6. “Informatics and Computer Science”. To participate in the competition, the candidate has also submitted: 8 textbooks and 1 practical textbook co-authored;



she has taken participation in 6 national scientific or educational projects and has been a leader of the Bulgarian team in 1 international scientific project.

After a detailed analysis of the presented scientific papers and evidence, I believe that Assoc. Prof. Sulova has the following points by groups of indicators:

- Group A of indicators – 50 points;
- Group B of indicators – 100 points;
- Group G of indicators – 405 points (with a minimum requirement of at least 200 points);
- Group D of indicators – 296 points (with a minimum requirement of at least 100 points);
- Group E of indicators – 405 points (with a minimum requirement of at least 100 points).

Therefore, Assoc. Prof. Snezhana Sulova has fully covered and significantly exceeds the minimum national requirements in groups of indicators G, D and E for holding the academic position of “professor” in the professional field 4.6. Informatics and computer science.

***4.2. Fulfillment of the requirements for holding the academic position “professor” in the professional field 4.6. Informatics and computer sciences according to art. 77, item 5 of PRAS in the University of Economics – Varna***

According to the attached Certificate – Declaration for holding the academic position “Professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics” at the University of Economics – Varna (in effect from 01.07.2021) Assoc. Prof. Snezhana Sulova has presented the following for participation in the competition:

- 11 scientific papers with 105 points in this section (60 required);
- 11 scientific articles and extended articles with 122.5 points in this section (with a minimum requirement of 115 points). The requirement for at least one extended article is also met;
- 11 publications in Scopus and/or Web of Science, for which she earns 240 points in this section (with a minimum requirement of 30 points);
- 37 citations in Scopus and/or Web of Science, with which she earns 555 points in this section (with a minimum requirement of 15 points);
- 2 defended PhD students in the professional field 4.6., which gives her 80 points in this section (with a minimum requirement of 40 points);
- 9 participations in national scientific or educational projects; she has been the leader of 4 national scientific or educational projects, 1 international scientific or educational project with which the participant earns 295 points in this section (with a minimum requirement of 15 points).

The requirements for holding the academic position of “professor” in the field of higher education 4 in University of Economics – Varna have been fully met.



## **5. Quantitative and qualitative evaluation of the teaching activity**

From the presented *Documents about the work load* it is evident that Assoc. Prof. Snezhana Sulova fulfills the quantitative indicators for the teaching activity. She teaches the following:

- 10 disciplines to students in the Bachelor's degree, 1 of which in Russian, 1 in English: Informatics, Internet Technologies, Office Applications, Logical and Functional Programming, Introduction to Informatics, Web Technologies, Client Web Programming, Interactive Design and Applied Programming, E-business (English), Informatics (Russian), Graduation seminar;
- 11 disciplines in the Master's degree, 1 of which in English: E-business part 1, Internet sales, Management Information systems, E-business, Web technologies, Web technologies (English), Business analysis and knowledge extraction, Digital marketing technologies, Computer technologies in advertising and media communications, Search engine optimization, Java Script programming;
- 2 disciplines to Erasmus students: Web technologies, User Experience Design;
- 2 disciplines to students studying at the Center for Vocational Training in the specialty "Pedagogy": Information and communication technologies in education, Methodology of education in information and communication technologies in education.

Assoc. Prof. Sulova has participated in the development of the curricula of the disciplines she teaches in the Bachelor's and Master's degrees; in the preparation of the curricula for "Internet Technologies and Communications" and "Intelligent Data Analysis" for the doctoral program "Informatics" and the curricula for "Internet Technologies and Communications" and "Data Analysis and Knowledge Extraction" for the doctoral program "Application of computing technology in economics"; as well as the Web technologies, User Experience Design curricula for the Erasmus program.

This gives me reason to give high marks to the educational and pedagogical experience of the candidate in the competition.

Assoc. Prof. Snezhana Sulova skillfully combines her serious scientific and practical experience with her teaching work. She works actively with students and PhD students on research projects. She participates in the committees for doctoral exams, advising graduates and reviews theses and course projects. In the period 2012 – 2021 Assoc. Prof. Sulova was the scientific advisor of the bachelor's theses of 22 bachelors, the master's theses of 41 masters and she reviewed 13 master's theses.

I can confidently say that the candidate in the competition has the necessary teaching experience and is well-prepared and ready to hold the academic position of "professor".



## **6. Identification of the contributions of the research work**

The contributions of Assoc. Prof. Snezhana Sulova can be divided mainly into scientific and scientifically-applied in the following way (following the numbering in the presented *List of scientific papers for participation in the competition for "professor"*):

- A new model for extracting knowledge and analysis of data from Internet sources, consistent with the specifics and diversity of data on the Internet has been developed and tested and allows the flexible application of different approaches to analysis (publications [1], [2], [4], [7], [8], [9], [15], [17], [25], [26], [27], [29], [30], [35]);
- Approaches to the application of data mining and text mining techniques in various business activities and sectors of the economy have been developed (publications [2], [4], [9], [11], [13], [14], [16], [23], [26], [27], [35]);
- Frameworks for innovative digital big data processing in the construction and logistics sectors have been developed and a prototype for big data management and processing in the logistics industry has been proposed ([3], [5], [31]);
- A methodology for evaluating e-commerce websites based on expert judgment, databases, analytical systems, and data extracted from Internet sources has been developed ([6], [28]). A classification of the types of e-commerce software platforms has been prepared and recommendations on their applicability have been made ([10], [24], [39], [40], [41]);

The developed textbooks and online textbooks, practical textbooks and additional learning materials for E-business [6], [10], [19], [20], [28], [39], [40]; Business Analysis and Knowledge Extraction [1], [2], [4], [7], [8], [13], [15], [25], [26], [35], [38]); Internet technologies ([43]) and for Informatics ([37], [42], [45]) can be defined as applied contributions.

The candidate's publications have made an impact on the scientific works of other authors, indexed in world-famous databases of scientific information, which shows that the results obtained are of high scientific value.

The presented research and the obtained results prove the serious scientific potential and define Assoc. Prof. Snezhana Sulova as a dynamic researcher with serious scientific achievements and skills for research and critical analysis.

## **7. Critical remarks and recommendations**

I have no significant critical remarks about the candidate in the competition.

Assoc. Prof. Sulova has serious scientific competencies and I think it would be good to focus a larger share of her research resources on publishing her scientific results mainly in publications, referenced and indexed in world-famous databases of scientific information.





It would be very interesting to me to apply the model proposed in the monograph for data related to the higher education system. I believe that such an application can be easily integrated in the study of the quality of education, the scientific activity of the academic staff, etc. and this would be useful for optimizing and improving these processes.

### **8. Conclusion**

After getting acquainted with the materials and scientific papers provided by Assoc. Prof. Dr. Snezhana Dineva Sulova, I confirm the compliance of the candidate's results with the requirements of ZRASRB, the Regulations for the implementation of ZRASRB and the Regulations for the Development of the Academic Staff at the University of Economics – Varna for the academic position “Professor” in the professional field 4.6. Informatics and Computer Science. The candidate significantly exceeds the minimum national requirements in the professional field, as well as the additional requirements of the University of Economics – Varna.

Based on the above, I give a **positive assessment** of the candidacy of Assoc. Prof. Dr. Snezhana Dineva Sulova.

**I recommend** to the scientific jury to propose to the Faculty Council of the Faculty of Informatics at the University of Economics – Varna to **select Assoc. Prof. Snezhana Dineva Sulova, PhD to take the academic position of “Professor” in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and computer science, scientific specialty “Informatics”.**

03.02.2022

Burgas

Prepared the review:

(Prof.<sup>l</sup> E. Sotirova)