



### ABSTRACTS

of scientific publications of **chief assist prof Yanka Georgieva Aleksandrova**, Department of Informatics, University of Economics – Varna for participation in a competition for the academic position “Associate Professor” in the scientific specialty “Informatics”, published in State Gazette issue 85 / 2021, p. 43

#### **A. Scientific publications for participation in the competition for the academic position “Associate Professor”**

##### **I. Monograph**

<b>General number</b>	<b>Number in the category</b>	<b>Title</b>
1	1	Aleksandrova, Y., Machine learning application for credit risk prediction in peer-to-peer lending platforms. Varna: Science and Economics, 2021, 258 p. – (Monographic library Prof. Tsani Kalyandjiev; Book 79 ). ISBN: 978-954-21-1090-3
<p>The goal of the present work is to propose and test a methodology for the use of machine learning in predicting credit risk at online peer-to-peer lending platforms.</p> <p>Presented are the nature of alternative finance, the specifics of the various business models and are drawn some of the more significant trends in this field. The particular importance of assessing credit risk and predicting the non-repayment of loans is pointed out.</p> <p>Compared are methods of credit risk prediction and are drawn the advantages of machine learning methods over scoring and statistical methods. On the basis of existing methodologies there is put forward a modified one, based on Microsoft Team Data Science Process for using machine learning in order to predict credit risk. In the new methodology there was added a “Model Interpretation” stage and was modified the important stage of modelling through the integration of binomial and multinomial classification models.</p> <p>The application of the methodology is demonstrated using actual data provided by a platform that is a global leader in peer-to-peer lending: Lending Club. Presented are suitable information technologies for the execution of each individual stage. There are provided program codes in the programming language R, a great number of figures and tables. There are formulated conclusions and recommendations connected with the execution of each stage of the proposed methodology. The results of using the methodology support the author’s proposition that using machine learning methods there can be achieved a good level of credit risk prediction, which would contribute to reducing the share of bad loans, improving the structure of loan portfolios and optimizing the profits of peer-to-peer lending platforms.</p>		

##### **II. Other monographs and extended scientific articles**

<b>General number</b>	<b>Number in the category</b>	<b>Title</b>
2	1	Aleksandrova, Y. (2021). Predictive analytics implementation in the logistic industry. Electronic journal “Economics and Computer



		Science”, Issue 2, pp 6-22, ISSN 2367-7791
		<p>Nowadays more than ever supply chain networks must meet increased demands. The digital transformation of the business is a necessity for the companies in the field of logistics in order to be able to increase their competitive advantages. During this transformation one of the most significant part plays the predictive analytics. Data driven decision making is crucial to supply chain activities. This however requires a more holistic view on implementation of predictive analytics in operational logistics processes. This paper aims to present possibilities for applying predictive methods in different operational processes in the context of a modern machine learning methodology framework and to demonstrate appropriate methods, techniques, algorithms, and software technologies. The scope of the research covers business processes in logistics organization. Several methodologies for design of predictive analytics frameworks have been evaluated and on this basis an adaptation of Microsoft Team Data Science Process is proposed. The methodology is demonstrated with an original practical implementation on a dataset provided by a logistics company. During each stage from the methodology suitable technologies, machine learning algorithms and evaluation measures have been applied. Conclusions are drawn regarding possibilities to implement the framework and to extract useful knowledge. Since the presented models are fitted to the used data set, the model explanation and interpretation is limited to the inherent data patterns and dependencies. Empirical results show that the best performing models are those trained with stacked ensembles and XGBoost algorithms. The model interpretation is implemented with SHAPley values and Partial Dependency Plots.</p>
3	2	<p>Petrov, P., Sulova, S., Radev, M., Aleksandrova, Y., Stoyanova, M., Mileva, L., Yankov, P. (2020). Digitization of business processes in construction and logistics: [Electronic resource]. Varna: Knowledge and Business, 251 p. - (Monographic library Knowledge and Business; Book 8). ISBN 978-619-210-049-0.</p>
		<p>The purpose of this study is to review and theoretically justify the possibilities for applying digitization in the construction and logistics sectors. The authors analyze from different perspectives the main problems in digitization based on a study of modern scientific publications on the topic of establishing the objective course of development of information and communication technologies.</p> <p>The monograph provides a methodological basis for determining corporate functions and processes to be digitized, approaches are considered to determine the degree of required digitization. A methodology for modeling and designing business processes upcoming for digitization has been proposed. The achievements for innovative digital processing of new and existing data are systematized and the possibilities for creating new and modifying existing processes for innovative digital processing are analyzed, especially in a high-data environment. Some concomitant effects of the digitization process have also been studied.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y.Aleksandrova has written the third chapter "Design and modeling of business processes for digitization" (p. 56-92). The chapter presents the methodological basics of modeling of business processes in the conditions of digital transformation. Comparative analysis of the leading methodologies for modeling business processes has been carried out. Two author's approaches for modeling the business processes upcoming for digitization are proposed – modeling of business processes, the elements of which are business activities, and modeling processes, the elements of which are business objects and business events. A way of tying and mapping these approaches is also presented.</p>



4	3	Atanasova, T., Parusheva, S., Aleksandrova, Y., Stoyanova, M., Radev, M. (2020). Strategies for digitization in the areas "Real Estate Management" and "Construction Economy". Varna: Science and Economics, 252 p., ISBN: 978-954-21-1033-0.
<p>The monograph addressed various aspects of digitalization and digital transformation for the construction sector. The research areas that have been selected are "Real Estate Management" and "Building and Construction". Best practices have been analyzed and compared, benchmarking of business processes with the best global and national achievements has been proposed.</p> <p>A methodology for realization of a project for digitization and preparation of a conceptual budget for digitization of a construction company, as well as key indicators for measuring the achieved degree of digitization, has been proposed. The authors provide guidance on the training on the issue under review and recommendations for updating existing curricula in higher educational institutions in Bulgaria.</p> <p><b>Summary of the parts written by Y. Alexandrova.</b> Y. Alexandrova participated in the development of a methodology for the implementation of a digitalization project in the researched areas, including defining the scope and objectives of a digital transformation project, forming a budget, assessing the cost of data architecture, applications, and infrastructure. The proposed curricula in the higher schools in Bulgaria, in which subjects in the field of digitization for areas of construction and real estate management are studied. A comparative analysis has been carried out and recommendations have been given to improve the curricula. Best practices for visualization of key performance indicators are presented and analyzed.</p>		
5	4	Atanasova, T., Filipova, N., Sulova, S., Alexandrova, Y., Vasilev, J. Intelligent analysis of students data. (2019). 88 p.. - (Monographic library Knowledge and Business ; Book 4), ISBN: 978-619-210-045-2.
<p>The purpose of this monograph is to create a methodology for intelligent analysis of student data, which includes data collection and processing with different methods of analysis, in the environment of different software products, when used by researchers with knowledge of different aspects of intelligent data analysis and study of the studied set of several perspectives. In particular, the proposed methodology uses statistical methods, neural networks, decision trees and specialized methods for processing unstructured information. The students from the specialties "Informatics" and "Business Information Systems" from the second and fourth year, trained at the University of Economics – Varna, are the subject of research. Their opinions, attitudes and assessments related to the learning process are the subject of their research.</p> <p>The scientific team processed with modern analytical methods the data from two consecutive years using the following specialized software products: Rapid Miner, Alyuda Neuro Intelligence and PSPP. A knowledge base for students has been created. The methodology for intelligent data analysis is justified and validated with empirical research.</p> <p><b>Summary of the parts written by Y. Aleksandrova.</b> Y. Aleksandrova has applied statistical methods and methods based on tree-based solutions for the study of addictions, verification of hypotheses, extraction of rules and knowledge from student data. The conclusions formed are implemented in the created knowledge base.</p>		



### III. Scientific articles

General number	Number in the category	Title
6	1	Aleksandrova, Y. Comparing Performance of Machine Learning Algorithms for Default Risk Prediction in Peer to Peer Lending. (2021). TEM Journal - Technology, Education, Management, Informatics, UIKTEN - Association for Information Communication Technology, Education and Science, 10, 2021, 1, 133-143, ISSN 2217-8309
<p>The purpose of this research is to evaluate several popular machine learning algorithms for credit scoring for peer-to-peer lending. The dataset to fit the models is extracted from the official site of Lending Club. Several models have been implemented, including single classifiers (logistic regression, decision trees, multilayer perceptron), homogeneous ensembles (XGBoost, GBM, Random Forest) and heterogeneous ensemble classifiers like Stacked Ensembles. Results show that ensemble classifiers outperform single ones with Stacked Ensemble and XGBoost being the leaders.</p>		
7	2	Aleksandrova, Y., Parusheva, S. (2019). Social Media Usage Patterns in Higher Education Institutions - An Empirical Study. International Journal of Emerging Technologies in Learning [iJET], Vienna : International Association of Online Engineering, 14, 2019, 5, 108 – 121, <a href="https://doi.org/10.3991/ijet.v14i05.9720">https://doi.org/10.3991/ijet.v14i05.9720</a> , ISSN: 1863-0383, ISSN: 1863-0383
<p>The main goal of this research is to identify some notable trends, opportunities, and limitations regarding the application of social media in higher education based on studying the way students use social media during their education.</p> <p>The research is focused on the impact of social media on the process of learning, creation and distribution of education related content, as well as on education related communication. The target groups of the research are students in University of Economics - Varna enrolled in different bachelor and master programs. An association analysis was implemented to identify the most common patterns regarding the application of social media in the education process. Statistical methods for testing hypothesis were used to assess the relationship between students' specialty and derived social media patterns.</p> <p>The findings show that Facebook groups are a preferable social media tool for communication with colleagues, content sharing and distribution, while wiki and university Learning Management Systems (LMSs) are most used for content creation and additional learning. Some social media channels are preferable for content creation and additional learning compared to scientific databases and e-books.</p> <p>Following the research results a conclusion can be drawn regarding the leading part of the students in initiating the use of social media compared to the relatively smaller role of the academic staff in this process. A medium to small relationships were discovered between students' specialty and the application of content sharing communities and forums in knowledge process with students in computer science more likely to use these social media types compared to students in economics.</p>		
8	3	Parusheva, S., Aleksandrova, Y., Hadzhikolev, A. (2018). Use of Social Media in Higher Education Institutions – an Empirical Study Based on Bulgarian Learning Experience. TEM Journal - Technology, Education,



		Management, Informatic, Novi Pazar, Serbia : UIKTEN, 7, 2018, 1, 171 - 181., doi: 10.18421/TEM71-21, ISSN 2217-8309
<p>Social media have enormous power and trigger changes in whole spectrum of businesses, as well as learning and education. A study of students' adoption of social media at the University of Economics – Varna (UE-Varna), Bulgaria, has proven its significant impact on young people. Using online questionnaire among 378 students, the high popularity of social media has been confirmed. An important research question is whether higher education institutions teaching students mainly in the fields of social, economic, and legal sciences use the benefits of the social media in the context of Learning Management Systems (LMSs) and integrated social media tools. The majority of the examined 24 universities use two LMSs - Moodle and Blackboard Learn. Both possess tools like forums, chat, wikis, internal messaging, blogs, learning groups, collaboration tools. The study of the two Moodle platforms implemented at the UE-Varna shows use of discussion forums, chat, and internal messaging.</p>		
9	4	Aleksandrova, Y., (2017). Developing Business Intelligence System in a Building and Construction Company, Izvestia Journal of the Union of Scientists-Varna. Economic Sciences Series, 2017, 2, pp 217 – 224, ISBN: 1314-7390 2603-4085
<p>The paper represents the implementation of Self-Service Business Intelligence System (SSBIS) in a concrete production company. A brief comparison of possible BI and analytics platforms was made, and the chosen platform was Power BI Desktop. A data model was built using snowflake schema design pattern. In order to decide on implementation approach was performed a comparison between two main alternatives – with or without using OLAP cube. As a result, and according to predefined business criteria like total costs and short implementation period was decided to use direct query against the operational relational database. Using functional capabilities of Power BI Desktop were demonstrated several important measures and visualizations like cumulative sums, Pareto rule coefficient, customer profile, RFM score, etc. The process of building the SSBIS showed that a main problem was the lack of enough knowledge in business users of modern applicable analytics models and measures.</p>		
10	5	Nenova- Nogalcheva, A., Konstantinova, D., Alexandrova, Y., (2017). Contributing Factors for Oral Manifestations in Patients with End-Stage Chronic Kidney Disease, International Journal of Science and Research (IJSR), Volume 6 Issue 3, March 2017, ISSN: 2319-7064
<p>The authors aim to study the factors influencing certain oral manifestations characteristic of patients with chronic kidney disease. The study involved 70 patients. The objective findings were collected using criteria for the degree of coverage of the language and through the FitScan Breath Checker. Oral hygiene of patients was measured using the Greene and Vermillion index. The results show statistically significant correlations between the type of dentistry and the degree of halitosis and between the age of the patient and the degree of coverage of the tongue. The study demonstrated the influence of functional pathology on the frequency of defects in the dental ranks defects with age and among patients with chronic kidney disease. Yanka Aleksandrova has processed and analyzed the survey data using appropriate analytical and statistical methods using program language R.</p>		



11	6	<p>Konstantinova D, Nenova-Nogalcheva A, Pancheva R, Alexandrova Y, Pechalova P. (2017). Taste disorders in patients with end-stage chronic kidney disease. <i>Giornale Italiano di Nefrologia : Organo Ufficiale Della Societa Italiana di Nefrologia</i>. 2017 Jun;34(3):54-60. PMID: 28700183.</p>
<p>Authors aim to study taste distortion in patients with chronic kidney disease (CKD). One in four patients were divided into a control group and study group. The data were collected through a questionnaire and statistically analyzed. The results showed that 28.7% of respondents had a loss of taste (96.60% of CKD patients). A statistically significant correlation was found between the duration of treatment and the loss of taste, between the age of patients and the impairment of taste, and between the age of patients and the feeling of metallic taste in the mouth. Distortion in the sense of taste is an oral manifestation characteristic of patients with CKD. Yanka Aleksandrova applied the appropriate methods of descriptive statistics, verification of statistical hypotheses and removal of dependencies in the R environment.</p>		
12	7	<p>Aleksandrova, Y. (2005). Possibilities for integration of SADT and DFD methodologies in building of a functional model of information systems. <i>Izvestia Journal of University of Economics – Varna</i>, 1, pp 94 – 108, ISSN 1310-0343</p>
<p>The modelling of information systems requires the development of multiple models representing the system from a different perspective. The models describe the system at different abstraction levels and are used to define the existing ("AS-IS") and the new ("TO-BE") architectures. The construction of a set of models also poses the problem of their integration and balancing. This article offers approaches for sharing two of the most popular methodologies based on the structural approach – Structured Analysis and Design Technique (SADT) and Data Flow Diagrams (DFD). The possibilities for sharing the two methodologies in modeling information systems have been analyzed. Three integration options are proposed: 1) Creating two parallel models based on SADT and DFD and mapping them; 2) Create a model that uses both methodologies and 3) Development of a physical and a logical model of the existing and new systems with alternation of DFD and SADT methodologies. Specific guidelines for implementation are given for each of the options.</p>		

#### IV. Research papers

General number	Number in the category	Title
13	1	<p>P Petrov, S Ivanov, Y Aleksandrova, GP Dimitrov, AK Ovacikli, (2020). Opportunities to Use Virtual Tools in Start-Up Fintech Companies 20 International Multidisciplinary Scientific Geoconference SGEM 2020: Conference Proceedings, 18 - 24 August 2020, Albena, Bulgaria : Vol. 20. Informatics, Geoinformatics and Remote Sensing. Iss. 2.1. Informatics, Geoinformatics, Sofia : STEF92 Technology DOI: <a href="https://doi.org/10.5593/sgem2020/2.1/s07.032">https://doi.org/10.5593/sgem2020/2.1/s07.032</a>, 20, 2020, 2.1, 247 - 254. ISBN 978-619-7603-06-4, ISSN 1314-2704.</p>
<p>The digitalization of financial services at its current stage is characterized by high</p>		



dynamics in terms of information technology used, with the expansion and complication of the relationship with consumers, which requires constant improvement of the forms and methods of management of organizations offering financial services. The emergence of phenomena such as cryptocurrencies, blockchain transactions, fintech companies, and others modify the financial services market, which is traditionally dominated by banks and other large-scale financial organizations. To maintain their position in this highly dynamic environment, organizations offering financial services need to constantly adapt to modern information technologies and seek new approaches to connect with the end users through the digitalization of their activities.

The list of tools offered by us does not claim to be exhaustive and rather indicates opportunities, coverage of tasks, possible diversity. The individual virtual tools are suitable for certain phases of the process of working in start-up fintech companies. It is a matter of the entrepreneur's discretion which of these and how convenient they are for a given product, idea, and business model. In terms of price, most tools have zero or low price - free versions, free for micro teams (up to 5-10 users) or the price is according to the number of users or volume of consumption. This is a convenience for a start-up company, as it implies low operating costs. A significant problem could be the large number and variety of tools to use. Many products have features that cover more than one activity and/or can be integrated with third-party tools for other activities, which makes it easier to build an integrated start-up environment.

14	2	Aleksandrova, Y. (2019). Predicting Students Performance in Moodle Platforms Using Machine Learning Algorithms. Information and Communication Technologies in Business and Education: Proceedings of the International Conference Dedicated to the 50th Anniversary of the Department of Informatics, Varna: Science a. Economic Publ. House, 2019, 177 – 187, ISBN 978-954-21-1004-0.
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The research paper examines the application of machine learning algorithms to predict students' performance depending on their interaction with e-learning platforms. The research thesis is that success in a discipline can be predicted using data from the log files on the electronic platform. Several machine learning models have been trained to support the thesis using algorithms such as logistical regression, random forest, gradient boosting machine, XGBoost and neural networks. Data extracted from Moodle-based e-learning platform at the University of Economics – Varna were used. The results show that all models successfully solve the classification problem with an accuracy above 0.84. However, a comparison of performance metrics reveals better prognostic power of neural networks and XGBoost compared to logistic regression and random forest.

15	3	Aleksandrova, Y. (2018). Application of Machine Learning for Churn Prediction Based on Transactional Data (RFM Analysis). 18 International Multidisciplinary Scientific Geoconference SGEM 2018 : Conference Proceedings, 2 - 8 July 2018, Albena, Bulgaria : Vol. 18. Informatics, Geoinformatics a. Remote Sensing. Iss. 2.1. Informatics, Sofia : STEF92 Technology Ltd., 18, 2018, 2.1, 125 – 132, doi: 10.5593/sgem2018/2.1/S07.016, ISBN: 978-619-7408-39-3
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Machine learning covers a wide set of supervised and unsupervised algorithms for solving prediction, classification, and anomaly detection problems. One of the areas of their applications is for customer churn prediction. To build a model for predicting the switching of customers, data scientists use different demographics, social, transactional, behavioral metrics



and features. At the same time, most of the small Bulgarian companies still don't have the needed versatile and complete customer data. They rely mainly on information provided by the ERP system that generates mostly transactional oriented data. Small and medium sized enterprises at this stage are not planning major investments in marketing research and additional customer related sources and are limited to perform modelling and forecasting on transactional data.

The main goal of the current study is to propose a combination of RFM analysis and machine learning algorithms for churn prediction based on mainly transactional data. The dataset is extracted from ERP system of a regional concrete production company in Bulgaria. RFM scores are calculated for every customer for a period of 6 months before the end date of examination. The target value for prediction models is a churn metric indicating whether the customer has made a transaction in the next 6 months following the RFM analysis or not. Several machine learning algorithms has been applied such as Two-Class Boosted Decision Trees, Two-Class Neural Networks, Two-Class Decision Jungle, Two-Class SVM and Two-Class Logistic Regression. The experiments were performed in Azure Machine Learning Studio. Results showed that despite the limitations of RFM scores and metrics by using machine learning algorithms companies can predict with enough confidence the churning of their customers. The best model for churn prediction proved to be Two-Class Decision Jungle, Two-Class Boosted Decision Trees and Two-Class Neural Networks. There are no notable differences when using recency, frequency, and monetary values instead their scores (R, F, M and RFM).

16	4	Aleksandrova, Y., Parusheva, S. (2017). Social Media in Higher Education from Students' Perspective. 4th International Multidisciplinary Scientific Conferences on Social Sciences & Arts SGEM 2017, Albena, SGEM, 4, 2017, Book 1, pp 709-716, DOI: 10.5593/sgemsocial2017/14/S04.092, ISBN 978-619-7408-16-4 ISSN 2367-5659
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Nowadays we are witnessing the growing proliferation of social media in almost every sphere of our lives – from economics, to politics, society, and education. Undoubtedly, the new opportunities of various social media applications such as social networking sites, collaborative projects, blogs, wikis, content communities, forums, etc., have their impact on educational process for both teachers and students.

The main goal of this research is to identify some notable trends, opportunities, and limitations regarding the application of social media in higher education based on studying the way students use social media during the course of their education. The target groups of the research are students in University of Economics Varna enrolled in different bachelors and master programs. Data is collected with online survey specially designed for the purpose of this research.

During the research process, we have formulated three main area of interest, namely using the social media in the process of learning, creation and distribution of education related content. The study examines the usage of and the attitude to various social media applications. Results show that the application of social media is largely initiated by students and not so much by teachers. Facebook groups are preferable social media for communication with colleagues and content sharing and distribution, while wiki and Learning Management Systems (LMSs) are most used for content creation and additional learning. Some possible future research topics are given in the conclusion.

17	5	Parusheva, S., Aleksandrova, Y., Petrov, P. (2017). A Study of the Use
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		of Social Media in Higher Education Institutions in Bulgaria. 4th International Multidisciplinary Scientific Conferences on Social Sciences & Arts SGEM 2017, Albena, SGEM, 4, 2017, Book 1, 19-26, DOI: 10.5593/sgemsocial2017/14/S04.003, ISBN 978-619-7408-16-4, ISSN 2367-5659
<p>Social media has become a driver for significant change in a number of areas, including business and education. They are present in a dominant way in the lives of young people in Bulgaria. This study examined the adoption of social media of students following the example of students at the University of Economics – Varna, Bulgaria. The data were collected and analyzed from an online survey of 378 students from undergraduate and master's programs at the university. Almost 100% of respondents own a Facebook account, and every second student has an account on YouTube, Google+ and Instagram at the same time. Facebook and YouTube are the most frequently visited – over 90% and 67% of the user log in daily, respectively. This intensive presence motivates the focus of the study on whether state higher education institutions with training mainly in the field of social, economic, and legal sciences use the possibilities of social media in education adequately. One option is being considered – using training management systems and integrated social media tools by universities. The survey results reveal that most state universities use platforms that have integrated social media tools such as discussion forums, chat, wiki, internal messaging, learning groups, collaboration tools, etc. Relying on the funds included in the platforms, Bulgarian higher education institutions can stimulate and motivate participation, engagement, joint training of students in formal higher education and to achieve better educational and academic results. Guidance has also been given on the use of social media tools in the learning process.</p>		
18	6	Aleksandrova, Y. (2017). Possibilities for integration of CRM and ERP systems on the primer of Microsoft NAV and CRM Online. The Modern Logisics – business and education, Varna: Science and economics, 2017, pp 227 - 236, ISBN 978-954-21-0945-7
<p>The paper offers a technological architecture for integrating a Customer Relationship Management System (CRM System) and enterprise resource management system (ERP system) using Microsoft technologies. The architecture is represented by a diagram of the environment and location according to the TOGAF ADM (The Open Group Architecture Framework – Architecture Development Method). The technologies presented are indicative, they could be replaced by those from other manufacturers. The architecture is based on event driven service architecture (EDSOA) and aims to automate cross-functional business processes, optimize IT infrastructure costs and support decision-making by applying appropriate analytical models to consistent, relevant and up-to-date data.</p>		
19	7	Radev, M., Aleksandrova, Y. (2017). A New Approach For The Education Process In Bulgarian Universities. The Second Conference on Innovative Teaching Methods (ITM 2017), Varna, 2017, 216 – 219, ISSN 2367-7791
<p>The aim of this report is to present a set of policies that will lead to the transformation of training in programs in the field of informatics and computer science in Bulgarian universities from theoretically to practical oriented. A system for integrating certification courses from leading global IT companies into university curricula is proposed. Specific examples and guidelines for such integration are given. The advantages for students, faculty, universities, and IT companies have been derived.</p>		
20	8	Atanasova, T., Vasilev, J., Filipova, N., Aleksandrova, Y. (2016). A



		<p>Research on the Influence of Some Factors on the GPA of Students. // [Fifth] 5 International Conference on Application of Information and Communication Technology and Statistics in Economy and Education: ICAICTSEE - 2015: [Vol. 100]: Conference Proceedings, November 13 - 14th, 2015. - Sofia: University of National and World Economy, 2016, p. 415 - 419. [viewed 07 September 2016]. Available from: <a href="http://icaictsee.unwe.bg/past-conferences/ICAICTSEE-2015.pdf">http://icaictsee.unwe.bg/past-conferences/ICAICTSEE-2015.pdf</a>, ISSN 2367-7635</p>
<p>The purpose of this paper is to find the main factors influencing the GPA (grade point average) of students studying “Informatics” at University of Economics - Varna. An online survey with Google forms among fourth-year students is carried out in April 2015. A codebook and coding of answers is done. Statistical and artificial intelligence methods are applied to answer the main research question. Statistical methods (such as descriptive statistics and nonparametric tests) are used to find statistically significant dependencies. Neural networks are used to find practically significant dependencies. Formal description of the most important dependencies is given. The results of the application of statistical and artificial intelligence methods are compared. The results of this study are also compared with previous research work of other authors trying to find the most important factors influencing the GPA of students.</p>		
21	9	<p>Aleksandrova, Y. (2016). Influence of electronic academic bases on scientific research. The challenges of information technology in the context of Horizon 2020: Jubilee scientific conference, Svishtov: Academic publishing house “Tsenov”. 2016, pp 325 – 336, ISBN 978-954-23-1188-1.</p>
<p>This report examines two of the largest electronic academic bases in the field of Computer Science – Web of Science and Scopus. Comparative analysis has been carried out on selected indicators and conclusions on the influence of academic electronic bases on the processes for the creation and dissemination of research are formulated.</p> <p>For the purposes of the study, essential benchmarking criteria were selected, such as: scientific fields, scope, and structure of publications; scientific and bibliographic indicators for the evaluation of journals, authors, and publications; search tools and user interface; means of creating a bibliography.</p> <p>A comparison has been made of the level of citation by publications and publications in the field of informatics and computer science. Ten of the magazines with the largest SNIP (Source Normalized Impact per Paper) were selected, which are indexed in both bases. The comparison of the number of citations shows a clear advantage in favor of SCOPUS. As a result of the empirical study, a discrepancy is shown in the determination of rank and order of journals by the indicators used in SCOPUS (SNIP) and Web of Science (JIF – Journal Impact Factor). It has been concluded that the choice of an indicator for the arrangement of magazines by impact factor is to some extent a subjective issue. Some trends related to electronic academic bases have also been identified, which significantly support the processes for the creation and dissemination of scientific publications.</p>		
22	10	<p>Aleksandrova, Y. (2015). Customer segmentation methods based on recency, frequency and monetary. // The economy in a changing world: national, regional, and global dimensions: Proceedings from an international scientific conference. Volume 3. Varna: Academic Publishing house “Science and economics”. 2015, pp 187 - 192, ISBN:</p>



		978-954-21-0835-1
<p>The purpose of this report is to make a comparative analysis between RFM-analysis and various Data Mining methods for customer segmentation such as neural networks, decision trees and clustering. The data are extracted from the e-shop and the accounting system of a company for import and distribution of auto parts. The results show that compared to the methods considered, RFM analysis is best suited for identifying customer segments which are better understood by business user. Clustering methods allow to examine and analyze the unevenness in customer grouping, which directs analysts to search for the factors influencing this distribution. Decision trees are suitable for generating business rules for classification and prediction of the purchase volumes. RFM analysis is proposed to be preceded by a classification of customers with decision trees in order to evaluate the influence of independent variables and to determine the boundaries of the categories formed by RFM scores.</p>		
23	11	<p>Aleksandrova, Y. (2014) Self-service business intelligence systems – application and limitations in analytical CRM systems // Information technologies in business and education : Proceedings from international scientific conference dedicated to 45<sup>th</sup> anniversary of the establishment of Department of Informatics at University of Economics – Varna, 2014, pp 142 - 149, ISBN 978-954-21-0780-4</p>
<p>The report examines the capabilities and application of the new class of intelligent systems – self-service business intelligent systems specifically in the field of analytical CRM systems on the primer Microsoft Excel 2013 as part of business intelligence suite offered by Microsoft company. The main characteristics and advantages of this type of systems are indicated. The limitations and applicability of some of the most common analytical models in such systems are researched and evaluated. A technology model of a Microsoft-based business intelligence self-service system is presented, in which the analytical layer is implemented in the Microsoft Excel 2013 environment.</p>		
24	12	<p>Radev, M., Aleksandrova, Y. (2013). Combining Virtualization Technologies in SOA-Application. //Application of Information and Communication Technology and Statistics in Economy and Education : Proceedings of the Intern. Conf., 6 - 7 Dec. 2013. - Sofia : UNWE, 2013, 56 – 61, ISSN 2367-7635</p>
<p>The report analyzes possible aspects of the application of virtualization technologies during the development, testing, implementation, and management of service-based architecture (SOA) applications to achieve high reliability and quality of applications, shorter development cycles and easier modification and adaptation. The aspects of virtualization addressed are virtualization of services, virtual services, and an abstract layer of virtual services. The authors point to the main advantages of each of the technologies studied during the development and maintenance processes related to SOA-applications. The comparative analysis of these three virtualization aspects concludes with recommendations for the joint implementation of all three aspects of virtualization to combine the benefits of each virtualization technology.</p>		



## V. Textbooks and practical textbooks

General number	Number in the category	Title
25	1	Filipova, N., Parusheva, S., Aleksandrova, Y. (2017) Basics of information systems. Varna: Science and economics, 2017, 295 pages, ISBN 978-954-21-0920-4.
<p>The textbook was developed in accordance with the curriculum of the “Basics of information systems” discipline, studied in the specialty "Business Information Systems" at the University of Economics – Varna. The main purpose of the authors in writing the textbook is to summarize the achievements of the theory of information systems (IS) and to provide students with modern knowledge of IS elements and architecture, their construction and management, the types of information systems and their place in the organization and supply chain, their technological and information base, security, and protection.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y. Aleksandrova has written chapter four of the textbook – “Technological infrastructure of information systems”. The chapter presents the evolution of the technological infrastructure, with a description of the characteristics, architectures, and technologies at each stage. Various integration architectures such as Enterprise Application Integration Architecture (EAIA), Service Oriented Architecture (SOA) and Event Driven Architecture (EDA) are described. Current trends in the field of technological infrastructures are presented.</p>		
26	2	Sulova, S., Todoranova, L., Penchev, B., Aleksandrova, Y., Nacheva, R. (2018) Guide to preparing for a national informatics competition. Varna : Science and economics, 2018, 89 pages., ISBN 978-954-21-0979-2
<p>The guide is intended for all secondary school students who aspire to creative expression in the field of informatics. It is a good assistant in the preparation for the National Student Competition in Informatics, held annually by the Department of Informatics at the University of Economics – Varna. The tasks are divided into three groups according to the sections of the competition: programming, Microsoft Excel and web design.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y. Aleksandrova has written section 2 “Microsoft Excel”. The section presents functions and tools for data summarization and for linking data tables in Microsoft Tables. Complex tasks are set with a detailed description of their solutions.</p>		
27	3	Sulova, S., Kasheva, M., Filipova, N., Peneva, P., Aleksandrova, Y., (2015) Electronic Business 1st Part Business Modeling Analysis and Development of Business Information Systems . Varna: Science and Economics, 2015, 173 pages., ISBN 978-954-21-0865-8
<p>This textbook is intended for students studying in joint curricula with the Ural Federal University “B. Eltsin” (Ekaterinburg, Russia). It includes the following parts: A) Electronic business 1<sup>st</sup> part; B) Business modeling and C) Analysis and development of information systems.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y. Aleksandrova has written chapter three from part C – “Analysis of information systems”. This chapter describes organizational aspects of research and analysis of information systems, presents the requirements, specifics, and content of the system analysis. Two widely used methodologies</p>		



<p>based on the principles of the structured analysis are described: data flow analysis (DFA) with data flow diagrams (DFD) for building of a functional model and “Entity Relationships” diagrams for building an information model of information systems.</p>		
28	4	<p>Peneva, P., Aleksandrova, Y., Armianova, M. (2013) Business information systems: Textbook for distance learning. Varna : Science and economics, 2013, 274 pages, ISBN 978-954-21-0706-4.</p>
<p>The textbook is intended for students in master’s degree program “IT innovations in business” who study the discipline “Business information systems”. The training in this discipline is aimed at getting acquainted with the essence and general issues of the methodology of the information system design and implementation and on the formation of theoretical and practical knowledge of the most common classes of business information systems. Significant topics that are emphasized in the textbook are: the nature, architecture, general information structure, methodology and organization of building information systems; approaches for developing individual components of business information systems; ready-made business information systems, etc.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y. Aleksandrova has written the following chapters:</p> <ul style="list-style-type: none"> <li>•8. Analysis of the information systems. A methodology for creating a functional model based on data flow analysis and data flow diagrams is presented.</li> <li>•12. Organization of the information base. The chapter presents the characteristics and requirements of the information base, conventional form of organization, databases, and data warehouses.</li> <li>•13. Design of relational databases. The stages for relational database design are presented. The database normalization is described as part of the logical design. A sequence for developing of a database model based on Entity-Relationship diagrams in ERwin Data Modeler is also described.</li> <li>•15. Ready-made business solutions. This chapter presents two main classes of information systems – customer relationship management systems (CRM systems) and enterprise resource planning systems (ERP systems). Their characteristics, development and functional structure are detailed.</li> </ul> <p>To each of the chapters Y.Aleksandrova has also developed a test with questions for self-preparation.</p>		
29	5	<p>Filipova, N., Filipov, F., Aleksandrova, Y. (2013) Customer relationship management systems. Varna : Science and economics, 2013, 212 pages, ISBN 978-954-21-0682-1.</p>
<p>The textbook is intended for students in master's degree "IT innovations in business", studying the discipline "Customer Relationship Management Systems". The textbook presents the theoretical foundations of this kind of systems, their characteristics and functionality. A leading CRM system – Microsoft CRM is also represented.</p> <p><b>Summary of the parts developed by Y.Aleksandrova.</b> Y. Aleksandrova has written the following chapters focused on the Microsoft CRM system:</p> <ul style="list-style-type: none"> <li>•10. Product catalogue. Product catalogue configuration is described – the settings related to products, price lists, unit groups and discount amounts;</li> <li>•12. Service module. The chapter presents functions, related to customer service, such as creating contracts, service and case management, etc.;</li> <li>•13. Presenting the result information. Different forms and tool for presenting</li> </ul>		



the result information are described, such as: dashboards, charts, user views, etc. Presented are also variants for creating user charts, dashboards, views, as well as data export into external environments.

• 14. Built-in and user reports. Possibilities of the system for running different built-in reports are presented. A sequence of development of user reports with different grouping and aggregation levels, graphical and tabular representation of the result information, etc. is described.

To each of the chapters Y.Aleksandrova has also developed a test with questions for self-preparation.

30	6	Kantcheva, A., Parusheva, S., Todorova, M., Aleksandrova, Y., Yankov, V. (2012) Microsoft Word 2010. Microsoft Excel 2010. – Varna : Dedrax, 2012, 199 pages, ISBN 978-954-8576-32-1
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The goal of the authors is to introduce the reader to the functionalities of Microsoft Word 2010 and Microsoft Excel 2010 and the technology of their use in the modern automated office. Chapter 1 addressed Microsoft Word tools in 6 parts, which provide the product's editing capabilities, basic and some advanced options for text formatting, working with tables, document layout and preparation for printing, etc. Chapter two looks at Microsoft Excel. The content is thematically structured in 9 parts, each detailing the nature and specificities of the presented topics. Many and varied examples have been developed for the easier understanding of content.

**Summary of the parts developed by Y.Aleksandrova.** Y. Aleksandrova has participated in the development of complex projects in the Microsoft Excel environment. Each project is based on the primer of a different subject area and requires working with a variety of tools in Excel — built-in functions, formatting, merging and linking tables, aggregation of data, filtering, etc. The solutions of some of the project tasks are described in detail.

31	7	Kantcheva, A., Parusheva, S., Todorova, M., Aleksandrova, Y., Yankov, V. (2010) MS Office Excel 2007. Theory and practice. Varna: Dedrax, 2010, 191 pages, ISBN 978-954-8576-20-8.
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This textbook is intended for students from University of economics – Varna studying the discipline “Informatics”. Many and varied examples have been developed for the easier understanding. The detailed explanations of the proposed solutions allow for the self-implementation of each particular example by the students. With a wide range of open and closed questions, not only the main but also the specific moments of using Excel are emphasized, and the inclusion of the answers allows for self-verification of knowledge. Chapter Two presents many and varied tasks, through which students can strengthen and put into practice the theoretical knowledge acquired in chapter one.

**Summary of the parts developed by Y.Aleksandrova.** Y. Aleksandrova has participated in the development of the complex tasks in the second chapter. Each complex tasks involves different tools, functions, and features in Excel. Some of the tasks are described in detail and illustrated with tables and figures.

32	8	Kantcheva, A., Parusheva, S., Todorova, M., Koleva, D., Aleksandrova, Y. (2005) MS Excel. Theory and practice. El Print, 296 pages, ISBN 54-689-035-9
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The main purpose of this textbook is to help prepare the students from the first year of the University of Economics – Varna, studying the discipline "Informatics". Chapter 1 reviews the instrumental and basic capabilities of Microsoft Excel 2002. For each of the eight



themes in chapter one, the basic concepts are defined in a synthesized and systematic form, and the specifics of the issues under consideration are illustrated by many examples. There is also a wide range of open and closed questions about knowledge and self-assessment. Chapter Two presents many and varied tasks, through which students can put into practice what they have learned from chapter one.

**Summary of the parts developed by Y.Aleksandrova.** Y. Aleksandrova has participated in the development of the structure and parameters of the tasks and in defining the projects combining wide range of tools and functions in Excel environment. Detailed solutions are presented in some of the tasks and projects.

**Varna,  
9.12.2021**

**Signed:**

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