

Studies in Systems, Decision and Control 421

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Developments in Information & Knowledge Management for Business Applications

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Preface

In this book, we continue provide a critical look at the information management in business organizations by exploring knowledge aspects from theoretical and practical perspective. The compilation of chapters presented in this volume helps to define the range of activities, identify areas for future research, and draw practical conclusions. The variety of industrial sectors examined supports continuous gaining and usage of an efficient business analysis in organizations. Besides, the volume delivers an elaboration of multidisciplinary concepts, examples, and practices that can be useful for researching the evolution of developments in the field.

We start out with the “[Brand Marketing of the Police—The Dangers of a Subculture Within the Police’s Official Guiding Culture](#)” analysis. The paper examines internal and external processes of the police as well as the perception of those processes by others. Wherever threats are averted, or crimes are prosecuted, there is always the possibility of misconduct of individual police officers. If the police as an authority faces public criticism, its reputation suffers and is at risk. It appears that the increase in assaults against operational police forces and the associated monetary expenses for their medical treatment represents an economic factor.

In the next work titled “[Centre of Focused Social Security, Public Administration Instrument of Slovak Republic for an Effective Social Crisis Management](#)” the authors gather the latest theoretical knowledge on social crises in the Slovak Republic. They define legal framework, describe the meaning, mission, organizational structure, and principles of activity of the Centre of Focused Social Security as an instrument of the Ministry of Labor, Social Affairs and Family of the Slovak Republic for fast, simple and especially effective solution of social crises caused by mass unlawful dismissal of employees from companies which went bankrupt as well as caused by natural disasters, accidents of technical or technological systems or traffic accidents with multiple casualties and seriously injured civilians. In the research part, the authors present the results of the evaluation of the center’s activities current performance.

The chapter authored by Peter Seidner “[Where Are E-lympics?](#)” attempts to answer a question about a place of E-Olympics in modern digitized society. Electronic sports are making their way to the top of the entertainment industry, and they

are doing it fast. E-sports are rising in popularity all over the world in an unprecedented speed and volume. Professional e-sports athlete, once a dream, is now an actual goal of many young people who see it as an actual career option. Esports professionals need to practice and hone their skills daily in this extremely competitive industry which puts them on par with traditional sports. This begs the question whether e-sports has become large enough and has come close enough to traditional sports, to become a part of the Olympic games. In this article, e-sports are compared to traditional sports, and reasons for the International Olympic Committee to include e-sports in the Olympics are evaluated.

In the subsequent chapter “[The Context of the Circular Economy Model Implementation, Based on Indicators of the European Union in/for Ukraine by Means of Fuzzy Methods](#)” authored by Stepan Vorobec, Viktoriya Voytsekhovska, Olena Zahoretska, Vasyl Kozyk, methodological and applied tools based on the use of fuzzy set theory are developed in the context of a strictly formalized hierarchical information model—a system of input indicators, composite indicators, integrated assessments of each of the selected sections of the circular economy for European countries are included in the comparative pool.

The research performed in the “[Design Criteria of Public E-Services](#)” follows the classification of a wide range of public electronic services and an examination of each category of electronic services by synthesizing the findings of 100 scientific articles. The analysis aims to provide more specific knowledge on the corresponding services of public e-government, e-government, e-learning, e-transport, e-health, and public procurement, and some criteria that may indicate how to better design public e-services. Electronic services enable governments to interact effectively with citizens, companies, their employees, and other governments 24 h a day. In the interests of maximum usability, these services should respond to the dynamic demands of governments and citizens. Governments can only achieve better public electronic services by analyzing economic, cultural, political, and technical progress in the world. As a result, they should carefully create new electronic services, regularly monitor, and regulate them, and work with public and private institutions throughout the digital process.

The chapter “[Definition of Embedded Flexible Elements in Working Form and Working Contracts](#)” defines theoretical frame of flexible working forms, classic working forms, and flexible contracts in Slovakia. During COVID-19, pandemic restrictions and flexible working forms are a necessary part of our work life. Flexible elements are elements applied to classic contracts to ensure employee satisfaction and prevent major fluctuations. Organizations were asking questions by interview with HR professionals about forms and contracts, which were used mostly in their organizational structures. This work does not deal with the legislative definition at the level of EU member countries and national Labor Code in Slovakia. However, it provides an overview of the practical use of flexible elements in organizations. The result was the graphic processing of the division and figure—Display of Flexible Elements in Flexible Forms, Classic Forms, and division into groups. Results and conclusion could help to better understanding and segmentation of flexible contracts in Slovakia.

In the work titled “[Intelligent Urban Investment Management System](#)”, a theoretical narrative and implementation elements of the application supporting urban investment management are described. Further, specific solutions are presented that constitute a useful tool supporting the coordination of investments carried out by city offices. The emphasis of the study has been put on the road works those proper management and implementation every day significantly affects the functioning of practically the whole city. The inspiration for this study was to observe the activities of city services over years.

The next chapter presents a study on the “[Management and Legislative Problems of Slovak Self-Governments in Solving Extraordinary \(Not Only\) Nuclear Events](#)”. It focuses primarily on management problems involving municipal self-government in solving the crisis of the population in cases not only exceptional nuclear events. It stresses the need to respond flexibly with a legislative solution to the lack of regulation. The focus of research is to define the legal basis for the protection of the population at national level. It then centers on proposals for legal solutions that will enable adequate protection of the population of the affected territories in the Slovak Republic. Using selected scientific methods of examination, the authors critically evaluate the legislative difficulties limiting the preparation of the management of municipalities to cases of possible exceptional events especially nuclear events. The result and added value of our examination are proposals for more appropriate regulation in terms of protecting the lives, health, property, and social security of the affected population.

The work authored by Katja Zöllner, Rozália Sulíková “[Necessity of the Individual Approaches to the Employees in Times of COVID-19](#)” identifies that in a changing business world companies need the ability to assess which trends and developments are essential to sustain own workforce and accomplish the goal of staying competitive, and of being connected to employees and customers. Planning strategically with right stuff, qualitatively and quantitatively, is sufficient for the future. Previous fixed structures used in the companies before the coronavirus pandemic were followed by improvisation. Home office, short-time work, hygiene rules, and social distancing were enforced by governmental corona regulations. Accomplishing goals requires personnel motivation, a process that is cross-functional and goal directed while acting voluntary; moreover, crisis requires motivation, based on consistency. It is the aim of the present publication to point out the possibilities of how to achieve this.

In the next study on the “[Selected Theoretical and Practical Aspects and/or Specific Features of Providing Healthcare in Modern Socio-Economic Systems](#)” professional assessment of selected aspects related to the management of healthcare facilities in the current ongoing COVID-19 pandemic has been a topical issue. The operation of medical facilities and the required managerial skills (managerial roles) have recently become burning issues to optimize the functioning of the entities in question. The implementation of factors and elements of Industry 4.0 brings not only intelligent solutions in the field of know-how, but undoubtedly changes in the tools and techniques applied in the implementation of individual management functions. The new challenges concern revolutionary changes in management, personnel and value profiles of healthcare facilities. It is necessary to reflect on these

processes and adjust the readiness of management accordingly. Identifying changes in managing employees in the era of digitalization, with an emphasis on management practices in HR is a key issue which comprises several interconnected areas. The first area represents factors influencing providing health care. The second one represents the quality of management in the sphere of health care with the emphasis on selected aspects. Last but not least, it is the impact of a scientific and technical progress and digitalization on the management system itself.

The subsequent chapter on “[Sharing the Workspace in Mobile Applications](#)” argues that in mobile application stores such as the Play Store (app store for the Android platform), large variety of applications and games with original gameplay started to appear. Popularity of applications and mobile devices have increased. More often there are applications that allow people to work together, mostly sharing text or photo between users. Implementing such sharing is definitely more difficult than creating an application exchanging files between users due to problems with concurrency and synchronization of messages. The authors exploited workspace sharing using drawing and drafting applications like notes on the Android platform. They chose this platform because it is currently the most popular mobile operating system. Many tools and studies were used in the development of the application. The application allows to share a workspace on a board for drawing shapes with a brush and a text editor to create joint notes. As part of the work, API implements a server in Java that allows the connection to be handled between mobile devices with the Android system. The first section of this work describes the components of Android API used when creating the MultiDraw application. The second section describes the applications for sharing the workspace between devices with Android, available in the Play Store. Third section describes the MultiDraw application, both from a technical point of view and from a user’s point of view. Section four describes the structure of the server API and explains how to use it.

In the next work “[Food Industry Sector: Market Changes in Sectors, Potential of À La Carte Category](#)”, Matus Barath indicates that customers need change and their lifestyle changes their behavior. The market is clearly adapted to changes in customers behavior and shopping, creating new industries inspired by domestic and foreign culture, habits, and lifestyle. The main goal of this research was to find out which categories of snack meal customers prefer and find out main customers determinations of selected categories in snack meal sector. Respondents were asked three questions divided into groups due age, gender, and social status and three questions about customer preferences, which kind of food customers preferred. Relevant answers to the questions of the research helped to identify customer’s profile, the decisive personal, and social factors that determine the customer’s purchase in the Snack Meal sector.

The chapter “[Determinants of the Nairobi Securities Exchange Market Performance](#)” examines and analyzes Kenya’s financial system, specifically the financial market. The Kenyan financial market is an important contributor to economy, as it provides a platform for investors to make decisions and act on investment opportunities. The research looks at the performance of the Nairobi Stock Exchange

(NSE) in equity securities and the various financial institutions, as part of financial markets. The study was guided by the objective; to examine the effect of the selected macro-economic determinants of the stock market performance in Kenya. The study followed descriptive research design and used secondary data. The data spanned the period between 2007 and 2017. This study uses the regression model and is concluded to be statistically insignificant. The data was analyzed using GRETL. The results show that there is a weak positive relationship between the selected macro-economic variables and the NSE 20-Share Index as determined by the coefficient of determination (R) of 0.618, and Correlation Coefficient (R-Square) should be $>$ than 0, 3 the best value is 1, from the finding the value is 0.382 meaning that there exists a weak positive relationship between macro-economic variables and NSE 20 Share Index.

The work called “[Inflexibility in Flexible Business Request, Case of Organisations in Slovakia](#)” aims to find out actual offer measure of formal flexible working contracts on the Slovak labor market in 2018–2020 by experimental verification. Organizations were subject to criteria where emphasis was on three flexi conditions. In this, research was used quantitative data collection method, focused on passives interventional in experimental verification by author. *Experimental verification* (shortly experiment) was used with the possibility of applying flexible working contracts in organizations. Research identified inequality between offer and demand of flexible working contracts on labor market in Slovakia. This research contains data before COVID-19 pandemic restrictions.

The work authored by Bokayo Roba Gutola and Milos Mrva “[Correlation Between Foreign Direct Investment and Gross Domestic Product: Empirical Evidence from Kenya](#)” specifies that Foreign Direct Investment (FDI) is an economic phenomenon with significant impacts on a country’s Gross Domestic Product. Developing countries have embraced this trend over some time, and the results witnessed in their improved financial prowess. In this review, the temporal implication of FDI is analyzed in Kenya. Inferential and differential statistics such as the Pearson’s correlation and the R-squared have been used to investigate the relationship between FDI and the GDP using variables such as openness to trade, human capital, government spending, and private investments. The Pearson’s correlation results produced a 0.565 coefficient at the 0.001 level of significance. The R-squared value was 0.87, implying a strong positive FDI influence on the GDP in the Kenyan economy. The methodology used in this review could be replicated to determine other economic variables that facilitate an improvement in a country’s GDP.

The next chapter presents a study on the “[Net Promoter Score as Measuring Instrument of Customer Brand Loyalty](#)”. It describes current trends in measuring customer satisfaction because satisfaction with the product or brand leads to successful business models on the market. Loyalty marketing provides options depending on market preferences and leads to customer satisfaction measurements and higher loyalty. Customer loyalty also provides the base for Net Promoter Score (NPS). NPS can determine the strength and rate of product development and explain its connection to a growth and sustained success. Companies should perceive the weight of contentment

and decisions of the customers, who, based on NPS, are promoters, passives or detractors. The main purpose of this research is to determine and measure customer satisfaction in three companies based on brand loyalty, research questions, hypotheses, and alternative hypotheses. This research worked with 1050 responses from customers. Food industry sector—category À La Carte—has different expectations from the customer and specific needs orientations, such as product quality, where the customer experience may help to identify needs of improvement or necessary changes in companies.

The research performed in “[The Impact of Foreign Direct Investment on the Economic Growth of Developing Countries. Giving Example of Kenya](#)” developing countries in Africa has come to realize that foreign direct investments are a source of economic development, the source of employment, income growth, modernization, and above all reduction of poverty. Moreover, following the policies of the host nation, various studies show that Foreign Direct Investment (FDI) leads to technological advancements, contributes to the formation of capital, and favors international trade. This chapter aims at evaluating the impact of foreign direct investment on the economic growth of Kenya focusing more on the gross domestic product (GDP), Balance of Payment (BOP), and exports. The guiding question in this research paper is: What are the Impacts of Foreign Direct Investment on Kenyan economic growth? The plan involved observing and describing the behavior of the FDIs in Kenya without influencing them in any way. From the research, it is evident that the impact of foreign direct investment has positive impact on the growth Kenyan economy.

In the chapter “[Impact of Social Networks in the Information Activity of the Ukrainian Institute of National Remembrance: From Theoretical Understanding to Practical Implementation](#)”—modern trends in the functioning of the information society involve the active use of information and information and communication technologies in various spheres of society are described. One of the forms of social communication using the technical capabilities of the Internet has become social media. A feature of the use of social network resources is the ability to manage public consciousness with further control of the behavior of an individual or social group through the content of the information policy. In particular, social networks are used to form a certain attitude of society to the historical past, to popularize the idea of the need and importance of preserving the national and cultural heritage. The article considers the activities of UINR in the field of state memory policy in Ukraine, which the Institute has been conducting in the web space since 2014. The Internet communication channels of the institute, which are social networks Facebook, Twitter, Instagram, and YouTube, have been identified. The dynamics of growth of the number of subscribers of the Institute’s pages in social networks during 2017–2020 is traced. The specifics of the forms of information content presented by UINP in different social networks, their dependence on the characteristics of a social network are analyzed and revealed. The analysis of the attendance of social networks allowed us to conclude that there is a steady trend of increasing popularity of the institute’s pages in social networks among followers.

In the next work titled “[Model for Assessing Development of E-Government in Eastern Partnership Countries](#)”, development of e-government and its individual elements in the life of society, citizens, government, and business as global processes are explored. Creation of e-governments and the use of e-government technologies for the development of the information society and e-democracy are identified as priority areas of public policy in most countries. The article provides a comprehensive analysis of the e-government system in the countries of the Eastern Partnership. A thorough theoretical basis for approaches to understanding the concept of “e-government”, its features have been studied, as well as the methodological basis of comparative analysis, calculation of taxonomy coefficient, forecasting, which helped in further comprehensive study of the topic, has been analyzed. The authors investigate approaches to the evaluation of e-government development models in the countries of the Eastern Partnership. Emphasis is placed on comparing the dynamics of e-government development in the studied countries, comparing the current state of e-government development and its components in the countries of the Eastern Partnership.

Further chapter “[Digital Documentary Collections of National Cultural Heritage on the Ukrainian Regional State Archives Websites](#)” analyzes the processes of digitization performed by Regional State Archives of Ukraine. These trends have become noticeable since 2016, reaching the highest point in 2019–2020. As of 2020, there are still a small number of articles and scientific papers on the problems of cultural heritage document digitization of Regional State Archives of Ukraine. The monitoring research of Ukraine’s regional state archive websites indicates significant changes in the website organizational structure, their thematic content in comparison with 2016. In 2020, it was established that all Regional State Archives of Ukraine have e-archives compared to 2016. It has been found that e-archives provide up-to-date information. Scientific reference information, namely electronic guides /reference books, metric books, electronic records were discovered. It is emphasized that the development of digital communication has a great impact on the dissemination and promotion of cultural heritage through social networks, blogs, and tags.

The work “[Digital Teaching and Learning Resources of the Ukrainian Children’s Libraries Websites](#)” reveals the influence of information society on changes that have taken place in regional libraries for children. Website filling condition of regional libraries of Ukraine for children with digital teaching and learning resources and the personalized access is analyzed. A literature review shows that these issues tend to be insufficiently studied. Monitoring method was used to analyze the websites of 22 regional libraries for children of Ukraine. The following results were attained through the implementation of monitoring method, namely 87% of regional libraries for children had websites, 9% of library sites become unusable, 4% did not have the library site. The results of the analysis of website traffic statistics show that Ternopil Regional Library for Children is the most popular among children. Subsequently, it was found out that 10 websites of regional libraries for children did not have traffic statistics. Therefore, the publication suggests ways of improving organizational structure of websites to place teaching and learning resources.

In the “[Youtube Web-Projects: Path from Entertainment Web Content to Online Educational Tools](#)”, digital technologies that help to organize student learning regardless of the circumstances surrounding the COVID-19 epidemic are discussed. In the proposed article, the authors draw attention to the main conceptual approaches to teaching students using modern technologies, including the integration of video content into the learning process. The main attention is paid not only to the reproduction of the material, but also to the requirements for the creation of educational video content. Today, video content is a topical milestone in e-learning. The authors draw attention to the use of the largest video hosting on the Internet—YouTube and offer to pay attention to it not only as entertainment content, but also a certain educational platform. The focus is on the organizational and technical aspects of using YouTube in educational activities, the requirements for video content, including educational content posted on YouTube, the relationship of YouTube with social networks and related services that complement or expand its functionality.

The chapter authored by Rastislav Kulhanek, Philip Grund, Yasar Alp Mutlu, Philip Reiting, Lesia Kondratiuk, Lukas Rieder “[Operating Model for the Optimization of an Electronic Service of Group Learning Rooms at a University Library](#)” is concerned with analyzing the service time of the provision of group learning rooms at a university library. The study is based on a real-life situation at a faculty library of the University of Vienna. It examines arrival rate, system utilization, waiting time, number of students in the system as well as in a queue in a queuing model. A distinction is made between different days of the week as well as different months of a semester. The results show that the implementation of an electronic service system would significantly improve service time and benefit students and library staff alike.

Succeeding chapter “[Modern Approaches to Library Fund Management](#)” studies modern approaches to library fund management. Receiving information, its organization, storage, receipt, and dissemination of information among users are the main pre-defined tasks for libraries. The industrial breakthrough and informatization of libraries have significantly affected the development and general operation of libraries. During technological progress and forced measures due to the COVID-19 pandemic, the activities of libraries and their resources have partially and completely moved into the virtual world of the Internet. This remote method of operation made it possible to increase the popularity of libraries among users, the opportunity to use new approaches to modernize not only customer service, but also to modernize the management of library funds.

In the next study on the “[Optimization, Economic Feasibility and Legal Factors of Ticket Service System Implementation](#)”, the authors deal with studying the optimization, economic feasibility and legal factors of ticket service system implementation. Two models were building, the first one consisting only of Abendkassa ticket selling and the second includes both Abendkassa and Tageskassa to have a model with multiple servers. To sum up, a quality management system with time optimization can be considered. Multiple servers are definitely in their favor, because of a lower waiting time and more satisfied customers. This analysis demonstrates the ticket sellers should assess the situation, meaning waiting time and/or queue, and adjust their behavior accordingly. To improve the server activity and prevent system

overload, multiple servers can be used, meaning that multiple box offices should be used. Developed models show how analyzing the waiting time and the queue could help to improve customer satisfaction.

In the work “[Effectiveness of Economic, Information and Social Processes of Train Station of Ticket Sales System](#)”, the authors deal with the actual problem of study the effectiveness of economic, information, and social processes of train station of ticket sales system. They present the model of the queuing system at “St. Pölten Hauptbahnhof” and compare the waiting times at the ticket counters for one to six employees and the waiting times for one, four, and six vending machines. The authors compare a four server system with one shared queue with four single server systems with separate queues. They conclude that four vending machines might be too less right now, but as there is a backwards trend for buying the tickets at vending machines and we expect the percentages to go down even more in the future as more and more people are able to buy their tickets online or on their phones. Therefore, in the future four vending machines will be enough.

The chapter “[Service System of Human-Based Airport Check-In Process: Technical, Economic and Legal Aspects](#)” deals with the analysis of technical, economic, and legal aspects of the service system of human-based check-in process of airport. Forecasting number of worldwide passengers from 2017 to 2036 is studied. Check-in method of airline passenger worldwide is analyzed. The method of determine the average waiting time in the system and in the queue as well as the number of passengers in the system and in the queue is investigated. The methods of facilitating the airline and reducing the waiting time are presented.

In the “[E-Sports Development](#)”, the aim is to analyze e-sports and its influence on the service providers in gaming, with the possible application in new cost-efficient services delivery, to characterize e-sports organizations, and to identify problems and prospects for e-sports development. In theoretical part, the partial goal is to explain the importance of e-sports management in today’s world. Beginning of the theoretical part is dedicated to history of e-sports and then e-sports organizations as the main factors that affect the development of e-sports management. Last section of the theoretical part focuses on current trends in competitive disciplines in e-sports. In the practical part of the paper, we identified problems, prospects of e-sports, and economic aspect of e-sports, created recommendations for brands on how to apply e-sports in their marketing campaigns and SWOT analyses of Twitch and YouTube gaming platforms. The authors created an analysis of selected e-sports management programs at the world universities in order to compare the individual parts of which the study programs consist of (with special focus on Ukraine and Slovakia). The aim in this part is to define new, beneficial subjects that could potentially become part of the syllabus of the international management study program at Comenius University in Bratislava.

The chapter authored by Maria Ivanova “[Scientometric Analysis “Voice Over IP”](#)” investigated the dynamics of scientific publications on the topic “Voice over IP” based on the scientometric analysis which relied on the data from the following scientific databases: Scopus, Web of Science, Google Scholar, Science Direct, ProQuest, Wiley, IEEE, ACM, EBSCO, Springer. The results indicated that for the term “Voice over

IP”, there were significantly more publications compared to the number of works for the other related terms (which were “Computer telephony”, “VoIP communication”, “IP telephony”, “VoIP telephony”). The highest peaks in the number of publications happened between 2005 and 2008 (when most VoIP applications were rolled out for a mass usage). Another finding is that “Article” was the most popular document type of all the publications; as for the countries where the most works were published, these were the USA, Germany, and China—top countries in terms of research and development spending.

And the final chapter “[E-Sports Competitions](#)” claims that e-sports are a part of entertainment/sports that has been growing faster than any other over the last decade. Thanks to this unprecedented growth in the technological/digital section many organizations came to be over the years. Thus, in the first part of this chapter, the authors focus on the main organizations within the industry, their function, and activities since inception. In the second part, they analyze the most popular e-sports currently leading the competitive side of the industry, when it comes to the number of players, popularity, and viewership. Lastly, the authors focus on games that represent real-life sports in a form of a simulation, whether digital using a screen or virtual using VR software and hardware. The aim of this chapter is to summarize the main players within the industry being recognized as official e-sports bodies working on pushing the industry forwards and helping to develop the industry of e-sports within their respective regions. The same goal applies to the leading e-sports as they are the main representatives of the industry and serve as the main case studies as to why this industry is worth developing further as well as be researched further for the academic purposes.

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