Innovations in ICT, management, industrial and materials engineering

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This special issue provides creating synergies of “practice and research” increasing the potential and commercial viability of research and development in the field of Industry 4.0 paradigm, SMART technologies, intelligent manufacturing systems and applications, Lean management and manufacturing, simulation of manufacturing companies, the complexity of supply chain management, management and intelligent infrastructure (road, freight, public transport), RFID in manufacturing, wide range of ICT application challenges, communication ecosystem security, enterprise information system, traffic/transport/logistic issues in Industry 4.0.

Our goal was to create endless opportunities for collaborative networks in science, research and education and, of course, to transfer this knowledge to the academic and work environment. In the context of deepening mega-competition, science policy has a tendency to return the invested funds as quickly as possible, which is also reflected in efforts to accelerate knowledge transfer and the overall innovation process. The interdisciplinary of research is growing, resulting in the establishment of multidisciplinary research teams and workplaces.

Rapid socio-economic, scientific and technological development and computerization balanced by humanization, largely induced in developed countries by revolutionary advances in science and technology, together with deepening globalization, have also led to new trends, which are reflected in the research orientations. In general, research and development are required to answer the civilization challenges of the beginning of the new century.

Naturally, these orientations also reflect the peculiarities of the respective regions, but the selected directions of scientific research are generally identical.

This issue features six selected articles of high quality. The first article, with the title “Use of BIM Technology and Impact on Productivity in Construction Project Management” is focused on building information modelling as an illustration of the physical and functional characteristics of a technology that connects project information databases in every field. This research discussed the issue of the use of BIM technology and analyses BIM effect on productivity in construction project management.

The second article “Case study: The Simulation modelling to improve the efficiency and performance of production process” provides a comprehensive result of using computer simulation to increase the efficiency and efficiency of custom production of a company. The use of simulation modelling as a scientific method in research and practice brings benefits such as financial, time, material and energy savings, as well as streamlining activities in real practice.

The third article, “Software system design for the solution of effective material layout for the needs of production and logistics” talks about the problem of research of software solutions of the efficient layout of material within a Defined space for the needs of production storage and transport. The problem relates to using knowledge with branches of logistics, layout, math and geometry for needs of research and for needs the creation of an expert system of materials layout as the software application.

The fourth article, “Roadmap to an Adaptive Assembly Line for E-Axles”, talks about achieving high quality, high variety batch size production can be quite expensive. The focus of the presented research lies in high adaptive and cognitive aspects in the assembly along with qualitative elements.

The fifth article deals with “Application of AHP Method for Project Selection in the Context of Sustainable Development” and is focused on the multi-criteria nature of decision-making in the context of sustainable development (and its economic, social and environmental criteria) is a

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prerequisite for the application of multi-criteria optimization methods. The article aims to present the application of the exact scenario—Analytical Hierarchical Process in the decision process.

The main aim of the sixth article with the title “Development of Retail Network on the Example of Three Regional Towns Comparison in West Slovakia” is to show the specifics of the retail network of three regional towns in the Slovak Republic—Nitra, Trnava and Žilina. Based on the comparison result, regularities of space structure formation of the retail amenities of the mentioned towns in Slovakia were identified, and their features were pointed out.

Our sincere thanks to the Editor-in-Chief, Prof. Dr. Imrich Chlamtac and European Alliance for Innovation (EAI) for their great support and guidance during the entire process. We are also thankful to the reviewers for their efforts and all suggestion and comments in reviewing tasks of the manuscripts.

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Assoc. Prof. Eng. MSc. Lucia Knapcikova, Ph.D. is Vice-Dean for International Relations and Mobility at the Faculty of Manufacturing Technologies (FMT) of the Technical University of Košice. In 2017 she completed her Habilitation for Associate Professor at the FMT in the field “Manufacturing Technologies”. In 2011 she completed her PhD study at the Faculty mentioned above. Lucia Knapcikova is the author of more than 215 scientific papers

in Slovakia and abroad, and she is the owner of 6 utility models.

She participated in several international research projects, mainly in Germany. A most important project is H2020 Less Than Wagon Load (Project duration 2017–2020) in collaboration with Belgium, Germany, Netherlands, Italy and Slovakia, where she is the Faculty project coordinator. The project aims to develop a SMART specialised logistics cluster for the chemical industry in the Port of Antwerp to shift transport volumes from road to rail freight. She has participated in project EUROSTARS (BRIDGE2ERA Program) with the collaboration of the Technical University of Applied Sciences in Wildau (TH Wildau), Germany. The aim of the project is Industry 4.0 strategic orientation between universities and SME. Lucia Knapcikova is from 01.10.2021 principal investigator of an international project with the collaboration of TU Graz (Austria) and research institute Pro2Future (Austria). The scheme is Action Austria-Slovakia title of the project talks about Sustainable Production Systems - Enhancing Science and Education.

She lectured at the universities in Germany (TH Wildau), Czech Republic (TU Liberec) and Croatia (J.J. Strossmayer University of Osijek, Mechanical Engineering Faculty in Slavonski Brod). Her area of interest includes SMART technologies, SMART materials, applications possibilities directly in the industry. In 2018, she was awarded in the category “Personality of Science and Technology under 35

years”. In support of the development of science and technology, the Ministry of Education, Science, Research and Sport of the Slovak Republic and the recognition of the exceptional achievements in this field, awarded the Science and Technology Awards – the highest award in science and technology, for the year 2018.

She is a member of European Alliance for Innovation, Belgium (www.eai.eu), TEAM Society in Croatia and an active member of the Editorial Board of Acta Technologica Journal (Slovakia), SAR Journal (Serbia). She works as Guest Editor in the indexed journal (CC Journal) Wireless Networks-WINET. She is a responsible person for organizing of International conferences under EAI organization-MMS 2022, MMS 2021, MMS 2020 and previously MMS2019, MMS2018, MMS2017, MMS2016 and EAI Fabulous 2022 and EAI Fabulous 2021.

Prof. Dragan Peraković, Ph.D. received B.Sc. degree in 1995, M.Sc. degree in 2003, and Ph.D. in 2005, all at the University of Zagreb, Croatia, EU. Dragan is Head of the Department for Information and Communication Traffic and Head of Chair of Information Communication Systems and Services Management, all at the Faculty of Transport and Traffic Sciences, University of Zagreb, where he is currently a full professor. Dragan is visiting professor at

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Area of scientific interests and activities is: modelling of innovative communication ecosystems in the environment of the transport system (ITS) and Industry 4.0; AI & ML in cybersecurity, DDoS, Internet of Things; AI in e-forensic of communication ecosystems (terminal devices/services); design and development of new innovative services and modules.

Dragan is an author/co-author of more than 140 scientific papers in indexed journals and proceedings of international conferences and 14 chapters in international scientific books. Additionally, he is co-editor of more than 15 edited indexed books and proceedings. He participated in the work of several international scientific projects and research & development studies. Dragan is an MC member in COST action CA17124 - Digital forensics: evidence analysis via intelligent systems and practices (DigForAsp) & MC Substitute member in COST action CA15127 - Resilient communication services protecting end-user applications from disaster-based failures (RECODIS).

Dragan is a member of TM Forum (USA), IEEE (USA), DAAAM International (EU/Austria), SDIWC (Hong Kong), EAI - European Alliance for Innovation (EU), Association for promotion of innovative technologies InnovativeFET (EU/Croatia), International Association for Technological Development and Innovations (Ukraine), International Telecommunication Society - ITS (EU). Dragan is President of the Croatian Chamber of Transport Engineers since 2020. Dragan is in the top 0.1% of individuals who achieved the greatest success on the EAI rankings in calendar 2019 among the entire EAI community (EAI Fellows Class 2020).

Dragan is the first Chief Editor of the International Journal of Cyber-Security and Digital Forensics (IJCSDF), Hong Kong, and Guest Editor in a few SI in WoS indexed journals. Dragan is a member of the Steering Committee and General Chair at EAI MMS and EAI Fabulous conference series, and a member of big numbers of Program / Scientific / Organization Committee of International Scientific Conference, worldwide.