Introduction to the Business Intelligence & Big Data for Innovative and Sustainable Development of Organizations Mini-track

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The development of the Internet, social media, distributed databases, and a variety of mobile devices has caused a huge increase in data. Much of this diverse data in unstructured and structured forms has a high business value and, if properly utilized, can become an important organizational asset. It contains various information about customers, competition, labor market, and development trends for industries, products and services, as well as the public and political mood. For innovative and sustainable development, it is essential for organizations to utilize this data to increase sales, identify future opportunities and new markets, outperform the competition, enhance products and services, recruit talent, improve operations, perform forecasting, protect the brand, and identify areas for improvement to name a few. However, many organizations make a limited use of this valuable data available to them either because they lack necessary tools or do not understand the value of this data. The main objective of this mini-track is to provide organizations a theoretical, conceptual, and applied grounded discussion of Business Intelligence and Big Data (BI & BD) to aid in innovative and sustainable development, achieve competitive advantage as well as effective decision-making. This mini-track includes five papers, with the first paper nominated as the best mini-track paper.

In the first paper titled "Data-Driven Network Visualization for Innovation and Competitive Intelligence" Sarica, Yan, Bulato, Jaipurkar, and Luo present a new data-driven network visualization methodology and a system to assess and compare the knowledge positions of firms in the total technology space for innovation and competitive intelligence analytics. The methodology is based on the synthesis of innovation theories, network analysis and visualization, information sciences, and patent data. The GM-Toyota comparative case demonstrates its power for visual sense making. Its implementation in the cloud-based InnoGPS system is aimed to provide firms and managers with rapid, data-driven, scientifically grounded, and visually-informed innovation opportunities and competitive intelligence.

The second paper titled "What Sustains Individuals' Participation in Crowdsourcing Contests?" by Wang, Khasraghi, and Schneider identifies the factors that infulence individuals' continued participation in crowsourcing context. The authors conducted an empirical study using data from an online crowdsourcing contest platform, Kaggle, which delivers data science and machine learning solutions and models to its clients. The findings show that the community activities and team activities do not contribute to motivating the continued participation, but tenure does significantly affect the continued participation. The authors also found statistically significant effects of amount of prize, number of competitions, previous team performance, and competition duration on individuals sustained participation in crowdsourcing contests.

In the third study entitled "Effects of Quantitative Measures on Understanding Inconsistencies in Business Rules" Nagel, Corea, and Delfmann present results of an empirical experiment analyzing the effects of quantitative measures on understanding inconsistencies in business rules. To verify the research hypotheses, the focus was on three measurements: understanding accuracy, understanding efficiency and mental effort, measured via the percentage of correct answers to comprehension questions, the time needed for solving a given task and eye-fixation duration, respectively. The obtained results indicate that quantitative measures are associated with better understanding accuracy, understanding efficiency and less mental effort in business rules management.

In the fourth paper "Reinforcement Learning for Extended Reality: Designing Self-play Scenarios" Leal, Chapman, and Westerlund look at extended reality, a promising but often overlooked field, for training agents using reinforcement learning. The study reviews several techniques from the literature and then synthesizes the information in order to propose a recommended design. Meta learning offers an important way forward, but the agents' ability to perform self-play is considered crucial for achieving successful AI. Therefore, the authors focus on

improving self-play scenarios for teaching self-learning agents, by providing a supportive environment for improved agent-environment interaction.

Finally, the study "Big Data-driven Value Creation for Organizations" by Olszak and Zurada investigates an issue of Big Data (BD) and elements shaping creation of BD-based business value. In particular, this research builds and verifies a framework to provide business value based on BD. The proposed framework is distinguished by three components: (1) dynamic capabilities of organizations, (2) integrated process of BD resource exploration and exploitation, and (3) identification and measurement of business value creation based on BD. The developed model has been subject to initial verification. This verification was carried out in selected organizations using an in-depth interview method. The conclusions from the conducted research may prove to be helpful for all organizations that intend to use BD resources in their activities.