

Editorial Introduction to Issue 47 of CSIMQ: Cognitive Factors, Process Modeling, and Language Technologies

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This issue of Complex Systems Informatics and Modeling Quarterly continues the examination of different characteristics of complex socio-technical systems, focusing on three key areas: human and psychological factors in organizations, organization and business process architectures, and applied technologies.

The first two studies examining human and psychological aspects of decision-making and organizational processes open the issue.

The first article, “Loneliness in Digital Workplaces: Antecedents, Outcomes, and a Typology of Work Configurations”, represents the authors’ study of loneliness in digital workplaces through a systematic literature review. Digitalization of workplaces may lead to a lack of social relationships expressed as a feeling of loneliness that, in turn, is associated with psychological and, as a consequence, physical health problems of employees affecting their performance and commitment. Based on the analysis of 15 studies, the authors constructed a conceptual model of key variables. The model was empirically assessed, and the findings allowed suggesting clear work organizing principles.

The second article, “Cognitive Biases in Group Decision-Making – Raising Awareness through a Collaborative Serious Game”, explores the question of key cognitive biases in collaborative or group decision-making in business projects. As the authors indicate, cognitive biases often lead to reduced effectiveness and increased errors in decision-making. The direction is to teach how to recognize and mitigate biases with serious games. The authors developed a serious game and evaluated it in a large transportation company in Switzerland. The results showed that the collaborative serious game effectively raised awareness of the cognitive biases.

The next two articles, devoted to the design of an organization’s architecture and business processes, continue the issue.

In the article “Enhancing Military Architectural Frameworks with Method Chunks: A Modular Approach to Agile C2-System Design”, the authors consider the design of a military command and control system (C2-system). The research refines the understanding of how to select entry points and the sequence of modelling activities during the design. As proof-of-concept, the authors propose a modular, context-informed framework, an extension to the NATO Architecture

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Framework (NAF), that combines Navigation Guidance with a repository of seven reusable Method Chunks to support architectural design activities in a C2-system context.

The next article, “Managing Complexity in Object-Centric Process Mining: A Cohesion-Driven Decomposition and Aggregation Framework”, addresses the challenge of effective human comprehension of too dense and complex models discovered within Object-Centric Process Mining (OCPM) from event logs. The proposed framework uses formal means (such as Object-Centric Petri Nets, cohesion and coupling metrics, and weighted graphs) to structure discovered processes as semantically coherent sub-process modules that allow reducing the complexity of representation significantly.

The last article concludes the issue with an analysis of applied technologies.

In “Toward Real-Time Medical IVR in Latvian: Evaluation Framework and Comparative Analysis of STT and TTS Models”, the authors investigate capabilities of speech-to-text (STT) and text-to-speech (TTS) technologies for the development of a conversational interactive voice response (IVR) solution in the Latvian medical domain. In comparison with studies related to high-resource languages and general application domains, this research focuses on challenges associated with low-resource languages, domain-specific medical terminology, real-time interaction, and sensitive data processing. As a result, the authors developed a basis for identifying appropriate STT and TTS technologies for further investigations in this field.

The CSIMQ editorial team thanks all the authors for submitting the results of their scientifically innovative and passionate work for evaluation and all the reviewers for providing their valuable feedback for the submitted articles.