

Selected Topics on Business Informatics: Editorial Introduction to Issue 29 of CSIMQ

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Business Informatics is the scientific discipline combining computer science, business administration and information technology and investigating related phenomena in their socio-economical context, including companies, organizations, administrations, and society in general. As a field of study, it is closely related to the fields of management science, organizational science, computer science, systems engineering, information systems, information management, social science, and economics information science.

The objective of this thematic issue was to show the diversity of research in the field of business informatics, both from the perspective of application areas and from the research methodologies applied. Application areas visible in this issue are product development in manufacturing industries, online learning in universities, innovation activities in networks of museums, and curriculum engineering in educational organizations. Research methods include various quantitative and qualitative approaches combined with prototyping and the design science paradigm.

The thematic issue collection opens with the article entitled “Virtual Prototyping: Evaluating the Digital Twin Based Virtual Factory for New Product Introduction”. In this article, the authors address the need of several industries to replace physical prototyping with virtual prototyping for reducing product and production lifecycle costs and time. The focus of the paper is on new product introduction and the use of virtual prototyping in virtual factories and their “digital twins”. The study has the ambition to provide knowledge closing the gap between theories supporting the design and management of complex manufacturing systems, and integration and implementation of technologies in the application domain. The contribution to systems engineering is based on two industrial case studies and expert evaluations of a comprehensive concept, which integrates state-of-the-art technologies with systems development processes. The results indicate the usefulness of digital twin based virtual factories in new product introduction particularly for progressing the development of production processes and systems.

The second article, “An Empirical Research on Study Success in Times of COVID-19

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Pandemic – a Case Study” investigates the switch from traditional on-premises studies to online learning that took place in spring 2020 due to the COVID-19 pandemic. The focus is on analyzing the impact of online learning on study success. The empirical basis originates from a German university. The article uses triangulation theory and combines quantitative and qualitative methods. An online survey investigating factors for study success and dropout forms the core of the quantitative part. Here, the strength of influence of different factors receives particular attention. The qualitative part is an interview study examining reasons for learning failure and study success, as well as the critical success factors that affect the study success of students in the first semesters. One of the findings is that a new factor “adaptation to digital teaching” was identified that has a strong influence on study success, social integration, and study and learning behavior. The recommendations for German universities derived from the study include that institutional facilities for advising students and teachers should be created, in particular for support in digital communication and technical issues.

“Open Innovation Process for Inter-organizational Projects” is the third article in this issue. The article examines open innovation processes in (temporary) inter-organizational forms, such as projects with various organizational members. Many of these projects initiate open innovation activities to extend knowledge transfer to external parties, i.e., across the inter-organizational borders. The article develops an open innovation process for inter-organizational projects (IOP) as initiators of open innovation. The initial model is developed by action research with an IOP of museums and educational institutions implementing a series of hackathons. The model’s applicability for other IOPs is evaluated using a survey. Findings of the paper indicate the importance of collaborative activities for aligning the open innovation initiative with both individual partners' and common project goals.

The fourth article “Monitoring Services to Support Continuous Curriculum Engineering” addresses the challenge of maintaining compliance between the learning content provided by study programs, the actual state of art in the program’s domain and the needs of companies. The authors argue that rapid technological, organizational, and regulatory developments in many domains require more frequent updates in study programs than in the past. Monitoring services evaluating documents and information from the Web can support in providing valuable information to stakeholders both from education institutions (teachers, curriculum directors, and students, etc.) and industrial organizations (employers and employees). The paper proposes a Generic Monitoring System model for education (GEduMON) with system architecture, basic services and a basic service flow model. Furthermore, functional structure variability and behavior variability are investigated. The research work also includes an implementation of GEduMON and reports on evaluation results.

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