Socio-technical information systems: Design and application of socially-aware IT

First insights

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Abstract— **Business information systems have been shaping the workflows of an increasing number of enterprises in different domains. Nevertheless, rarely are they designed with the requirements, needs and values of the actual users in mind rather than being guided by management requirements and performance demands. The call for the focus on the social and thus user-centric aspects of information systems has grown more meaningful in the light of the development of machine learning based information systems such as recommender or classification systems. Thus, the goal of the special session on socio-technical information systems (STIS) is to highlight the importance of the interdisciplinary approach to design, analysis and applications of STIS as well as to provide a space for interdisciplinary research and application practice.**

Keywords- socio-technical systems, information systems design, virtual reality, business processes, ethical analysis, technical solutionism.

I. INTRODUCTION

As software applications and information systems have become pervasive in our working and private lives, researchers from computer and social science have increasingly stressed that these artifacts can shape and constrain interpersonal behavior in the working, communication and behavior environment.

Machine learning-based systems (MLS) add to this development by utilizing past behaviors (stored as historical data that used for training and calculation purposes) to derive suggestions about future behavior, e.g. by classifying results for decisional outcomes, identifying or predicting potential behavioral patterns that influence business decisions and in the accordant environment can directly affect individuals.

To be able to analyse and develop information systems that are designed for the society and with a direct applicability for societal needs, socio-technical systems design (STSD) need to be accepted beyond its primary scope, that of business information systems, towards the design of MLS.

Understanding the role of users, designers and engineers of these systems will contribute their conscious and transparent implementation in different business applications. Thus, these paper address some of the pressing issues such as co-creative design methods, language patterns of business process models and identification of ethical issues during data processing.

II. SUMISSIONS

The paper by Frankus et al. [1] introduces a current research question about the suitable methods of how to model real-life interactions and systems using virtual reality technologies. The research in progress identifies the challenges and advantages of co-creation of digital artifacts. The authors stress the participatory aspect of the design and outline an accordant process.

Participatory decisions can be taken at any stage of the process, starting from the project idea and conception. In the presented project, the content of the interactive VR scene was developed together with members of the public. Furthermore, the authors propose to introduce participatory decision-making tools right from the beginning of the process. These can be derived from the commons research or from new non-hierarchical organizational models and decision tools like sociocracy or systemic consensing.

The abstract by Revina [2] addresses the topic of business process models and their textual description as a potential indicator for process complexity. To achieve this goal, a domain-specific business sentiment lexicon was developed and lexicon keyword-based pattern matching algorithm extended by semantic and syntactic rules to extract subjective knowledge and assess attention efforts required to perform the process. To obtain information regarding meta-knowledge and reading efforts needed to comprehend the text, stylistic patterns expressed with a number of stylistic features was used. The future work will focus on to compare the textual databased and process mining-based process view, specifically in terms of complexity, and derive and

analyze discrepancies and commonalities between these two views.

The paper by Levina [3] introduces a mix methods approach to the design of machine learning systems (MLS) that considers ethical requirements and issues that are encountered during the design of a socio-technical systems. To illustrate the approach and its results a scenario-based use case analysis is lead. A food recommender system that builds upon a digital platform connecting eaters, restaurants and drivers is chosen as a specific scenario. The results of the ethical analysis are structured along the data processing stages that are needed for the computation of the recommendation. Exemplary realization of the solutions for the ethical issues are suggested. They are classified along the dimensions of business, user interface or system design demonstrating that the design of a socio-technical system requires a cooperation of several domains within the business system.

III. CONCLUSION

The research presented at the special session drafts an outline of the scope and importance of the design and integration of STIS in the business and user context. Without interdisciplinary work and methods focusing on the multidimensionality of the problem, the design of information systems will be following the technological imperative rather than actual user requirements. This development would foster the distrust towards technological solutions as well as extended use of digital applications enforcing the trend towards the technological solutionism as already described by Morozov [4]. Also Baxter and Sommerville [5] describe potential research questions and directions that would lead to user-centric information systems- a crucial and essential development in the current directions of information systems research.

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