Design and application of socially- aware IT

First insights

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***Abstract*— Information systems and technology are being developed at a high speed and enter the market in short cycles. This fast process is focused on the technology and the return of investment of these products rather than on the effects this technology has on its users and the environment. While the requirements of the user are increasingly being considered in the domain of user-centered design, the effects of the system use on, e.g., the people affected by the usage of this technology are not being taken into account. The contributions of this track provide use cases, suggestions and design approaches for information system that include or even specially focus on one of these topics. Therefore, the special track promotes the interdisciplinary research as an important asset for socially aware and therefore sustainable information system design.**

Keywords- Digitization, disinfromation detection, explainable AI, system design, socially aware informaiton technology.

I. INTRODUCTION

The use of information technology often comes with external costs, such as electricity usage for powering the devices, the use of rare earth materials to create the hardware as well as air and environmental pollution due to the energy sources and technological waste [1], [2]. These external costs are rarely present in the requirements engineering or price calculations of the resulting product.

The special track “Design and application of socially-aware IT” (DSAIT) is focusing on the research question of how an information system should be designed to take the requirements of an indirect user, i.e., the affected user, into account. The submissions of the track consider methods, approaches and their evaluation for the design and implementation of socially aware information systems. DSAIT aims to encourage research on these topics as well as to provide insights into the described issues based on quantitative and qualitative research results, thus providing a possibility to trace the developments in this area throughout the years.

The main focus of DSAIT is to highlight the interdisciplinary approach and empirical methods to design, analysis and usage of digital technology that focuses on the user an its environment as well as to provide a space for interdisciplinary research and discussion. The design, purpose and use of information systems varies across application areas and business domains. Therefore, the DSAIT submissions have multiple foci concerning the research methods as well as the research domains. The topics of the current submissions range from construction of machine learning-based systems (MLS) [3], ethical discussion on the socially aware information systems and their characteristics [4] to the use of explainable AI in the context of the online disinformation detection [5].

II. SUBMISSIONS

A conceptual prototype for the practical implementation of a Machine Learning method to solve Vehicle Routing Problems (VRP) in the context of sustainable "last mile" logistics is presented in the submission [3]. The prototype is based on the reinforcement learning system and uses "REINFORCE with baseline" algorithm for updating a parameterized policy. While this prototype machine learning based system considers the values such as of solution quality, runtime and automatism for the evaluation of its results, the social awareness is focused in the application of the described algorithm. The descriptions in the submission by Levina [4] address the characteristics of a socially aware information system (SAIS). The paper builds on [6] and distinguishes between the user of an information system and the affected user. The affected user is defined as a person or a group of persons who are directly or indirectly affected by the use of the information system. These could be, e.g. applicants that were rejected or approved for a job interview based on an automated filtering process, or external costs in terms of choice diversity, labor market development or environmental impacts of a food recommender system as described in [7]. Considering the affected users also brings the consideration for the environmental effects of the technology into the focus of the SAIS designers. Language as a tool that shapes the public opinion and discussion is also important for the description of a SAIS. Active formulation of the calculated results such as “the system decides”, “the algorithm prefers”, etc. are to be used with

caution. This formulation might initiate the impression that the software artifact has a kind of agency, while the user and the affected user are subjects to the information systems activity [8]–[10].

Contribution [5] by Bezzaoui presents an outline of an Information Systems research project, which takes a comprehensive approach to both researching and combating online disinformation. The project develops a data pipeline in which messages are extracted in large quantities from suspicious social media groups and messenger groups with the help of annotators. Based on this corpus, a machine learning-based system is trained that can recognize factors and stylistic devices characteristic of disinformation, which will be used for an explainable artificial intelligence that informs users in a simple and comprehensible way about the occurrence of disinformation.

These works demonstrate that interdisciplinary multi-level research approach for the design of information technology is beneficial not only for the users and producers but also for the society.

III. Conclusion

The research presented at the special session provides the outline of some of the topics and research methods that become increasingly relevant for the development and selection of socially aware information systems. In addition to the further empirical insights, frameworks and methods for requirements elicitation, testing, evaluation and feedback implementation will be the focus of the future SAIS research.

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