

**The Effect of Task Recommender System  
on Information Overload and Success Measures  
of Large-Scale Collective Deliberation Participants**

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**Ph.D. Thesis**

**Submitted to the Senate of Bar-Ilan University**

**Ramat-Gan, Israel**

**February 2016**

## Abstract

Large-scale collective deliberations systems enable organizational open innovation that involves a wide range of internal and external stakeholders (Klein & Convertino, 2015). A significant challenge for large-scale collective deliberation participants is the difficulty to understand the deliberation's "big picture" and locate tasks that are compatible with the deliberation needs as well as participants' preferences and skills (Shum, De Liddo & Klein, 2014). The research literature indicates that the participants are unable to allocate sufficient attention's resources to simultaneously carry out information access and contribution activities that may affect information overload (Briggs, 1994). The difficulty to locate appropriate tasks and the information overload phenomenon could reduce the participants' productivity while engaged in large-scale collective deliberation (Pirainen, Kolfschoten & Lukosch, 2010; Shum et al., 2014).

The most current studies emphasize the need for large-scale field experiments to examine the ability of task recommender systems to facilitate attention management, reduce information overload and improve success in large-scale collective deliberation projects (Geiger & Schader, 2014; Klein & Convertino, 2015). This study focused on the development and evaluation of general and personal task recommender systems that help large-scale collective deliberation participants to locate appropriate tasks according to the deliberation needs and participants' preferences. The applied recommender systems provided recommendations based on processes goals exceptions monitoring, following Klein's suggested framework (Klein, 2012).

The research questions were: a. To what extent can task recommender systems reduce participant's information overload, improve the quantity and quality of their contributions, and increase their satisfaction? b. How does the participants' perceived information overload affects the quantity and quality of their contributions and their satisfaction with the deliberation?

To answer these questions, a large-scale collective deliberation, which focused on idea generation, was carried out, for four months, using the Imen Delphi deliberation procedure (Passig, Cohen, Bareket & Morgenstern, 2015). 112 graduate Students from the School of Education at Bar Ilan University took an active part in the deliberation and contributed ideas to improve the chances of a successful Master's or PhD's theses. The participants were classified into three groups. Each group used a

different Recommender system: General task recommendations group, personal task recommendations group and a control group with no recommendations. Following the deliberation, the information overload data, the contributions quantity and quality data and the satisfaction data of the participants were collected via an online questionnaire as well as the derived data from the deliberation system.

The findings relating to the impact of the Recommender systems shows no effect on the participants' perceived information overload. However, using the personal task recommender system improved the creativity, novelty and specificity of the participants' ideas and increased the participants' satisfaction with the deliberation process. The findings relating to the effect of information overload on participants' success measures suggest that perceived information overload had a negative impact on contributions quantity, ideas quality, perceived net goal attainment, and participants' satisfaction with the deliberation process. We also found that perceived mental effort positively affected the contributions quantity and the perceived net goal attainment of the participants.

At the theoretical level this study confirmed the ability of goal oriented personal task recommender systems to improve the participants' contributions quality and the satisfaction from large-scale collective deliberation. It also confirmed the negative effect of information overload on contributions' quantity, ideas quality and participants' satisfaction in Large-scale collective deliberation platforms. The lack of a positive effect of the task recommender systems on the participants' information overload can be explained by the deliberation long duration, which reduced the participants' information overload and the potential impact of the recommender systems. At the practical level the study contributed to researchers and designers of recommender systems and large-scale collective deliberation systems, by offering effective examples of goal oriented task recommender systems.

It is recommended to carry out further research that will develop other goal oriented personal task recommender systems, focusing on other goals of the deliberation process, and will evaluate their impacts on other process and outcomes measures of large-scale collective deliberations. In addition, in light of the study's findings, relating to the negative impact of information overload on participants' success measures, it is suggested to research the causes and symptoms of this phenomenon in large-scale collective deliberation systems and consider further technological and process interventions to reduce it.