Analysing team activities in engineering design

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Introduction

To increase the potential of solving design problems, critical tasks in design are often conducted as team activities (e.g. idea-generation, concept selection etc.). Teamwork is useful in design as it facilitates the exchange of ideas, knowledge and resources, and thus affects the outputs of the design process (ideas, decisions etc.). To better understand both the design process and teamwork, researchers often study team activities. These studies are usually grounded on the work from other fields, such as psychology, sociology, neuroscience etc. Even the most common method for studying designers, protocol analysis, is taken from psychology. Since research efforts of studying design process from the designer's perspective are relatively recent, there is still lack of models to describe team activities and methods for analysing design teams. These models and methods should help in exploring the concept of the design process as a human act. However, although teamwork has been the subject of design research for the last 40 years, researchers still point out the lack of unified methods to study design teams.

Aims

This work aims to develop models for describing the team activities and methods for analysing teamwork in design. The models will cover various teamwork features, such as the inputs (individual characteristics, team size, type of design task etc.), the process (communication, interaction etc.), and the outputs (e.g. concept, product etc.). Methods will aim to combine the proposed models thus giving the possibility to conduct a more comprehensive analysis of teamwork.

Methods

The research will be based on the elements of the Design Research Methodology. Firstly, a literature review and initial set of experiments will form a basic understanding of existing models and factors which influence teamwork. Based on these insights, models will be developed to cover various teamwork features. Then, the models will be combined, and methods for analysing teamwork will be proposed. Models and methods will then be theoretically and empirically validated using the Validation Square framework.

Expected scientific contribution

The proposed research is expected to have the contribution for both, design theory and design practice. Theoretical contribution manifests in the models and methods for analysing teamwork which would aid researchers in understanding teamwork in design and the design process. The contribution to practice is in the development of tools for analysing teamwork which can be used by project managers to observe teams and identify potential problems.

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Keywords

teamwork, design teams, protocol analysis