UNIVERSITY OF CAMBRIDGE
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CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Exploiting music and dance notation to improve visualisation of data in BIM

The construction industry has a reputation of completing projects late, exceeding budgets and struggling with issues related to quality and safety. These characteristics are reflected in poor productivity numbers, where other sectors of the economy have improved their output per unit of labour in recent years. As a consequence, building of new facilities and structures is relatively expensive.

Suboptimal information sharing appears to be a factor that impacts productivity. It was recognised as a challenge for supervisors and engineers and results in management difficulties, supply chain issues and rework. Building Information Model (BIM) technology was suggested to improve dissemination of information but has limited adoption. A notation system for visualisation of project information in a BIM context was proposed to overcome current technology limitations that may cause its sparse use during the construction phase. The notation uses qualities of music and dance notations to provide supervisors and engineers with status information for elements and locations and enables adoption of lean principles to improve productivity.

A proof of concept of the BIM notation was tested in an experiment with employees from two general contractors. Participants were divided into two groups; one of the groups had access to the designed notations, the other did not. Both groups answered the same set of production related questions. While response times were not reduced, the accuracy did improve. The use of the proposed BIM notations appeared to make access to and interpretation of available information more effective, which resulted in better responses, in particular from participants with lower seniority.

This dissertation contributes to the area of BIM technology in construction. Specifically, it introduces a new solution for communication of project data that can have the potential to improve decision making by supervisors and engineers during the construction phase.

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