![Universität Stuttgart logo] Universität Stuttgart

Institut für Baubetriebslehre

Prof. Dr.-Ing. Hans Christian Jünger

Pfaffenwaldring 7
70569 Stuttgart

Telefon: +49 (0)711 685-66145
E-Mail: ibl@ibl.uni-stuttgart.de

2020, Stuttgart; Kurzfassung der Masterarbeit:

Evaluation of IoT in Construction Management [MA 173]

With advancements in BIM user interface and the wide range inclusion of different construction phases into digital management, seamless integration of virtual model with the built environment is possible. This has enabled BIM-based project management for construction projects beginning from project conception until facility management and extending up to Building life cycle. But this doesn't guarantee a constant and consistent evolution of working models and the industry being acclimatized to the usable technical advancement happening in the other spheres of research and development. Given the opportunities available in the ICT, it is important to understand the working prototype of BIM to integrate more digital applications for the efficient operation of the project, enabling business dimensions by generating and analysing user data, being more sustainable in energy & resource consumption and achieving zero accident project delivery.

IoT is one of the emerging technologies from the ICT upfront, RFID technology-based was the most used case in the AEC for project management. Using other means of data production and transmission protocols can be standardised based on factors influencing the project requirements. With the low cost of sensors, creating a digital twin of a project is now a possibility and the detailing is getting even better. Connecting anything on a construction project is the utmost potential what IoT could bring into AEC and project management. It is, therefore, the responsibility of AEC to steer the research into embracing new technologies such as IoT for better performance. Integration of IoT into BIM will always be met with challenges from both the sides and needs to be addressed not just individually but in an inclusive approach. The issues don't stop at the technical level, need of conflict management might arise. Having discussed the fragmented nature of the construction projects, at the organisational level the members need to have a clear approach in dealing with data ownership and intellectual property of the IoT enabled BIM models. Privacy of the participants needs to be protected and eventually deserving credits need to acknowledge for the participating members in data generation.

This report has tried to identify a possible way of solving some redundancy at the construction project sites. The suggested solution prototypes are a way to resolve the issue, but not necessarily the best or only way to solve the issues at hand. Nevertheless, the study provides future scenarios of IoT deployment in construction resulting in maximised digitalisation. The ideas discussed can possibly be inputs for future research and development in the attempt to digitalising the construction domain.