UNIVERSITY OF CAMBRIDGE
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CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Mobile information communication technology in the construction phase of infrastructure projects: application in practice

The United Kingdom (UK) construction industry continues to report poor productivity growth, recording no improvements in the past two decades. The industry is plagued with difficulties. One of the solutions widely suggested is the utilisation of Information Communication Technologies (ICT). Based on this premise, the aim of the research was to investigate how Mobile ICT (M-ICT), and more specifically tablet software, is being used in the construction phase of UK infrastructure projects. Quality Assurance formed the main focus, and this was investigated in the context of passive fire protection, where M-ICT use is prevalent. The purpose of this study was to: understand the specific uses of M-ICT utilisation and the benefits; highlight the changes to work practices; and identify the challenges. The output of this research is the development of a checklist for future projects to assist in the first time implementation of M-ICT. The intention is to help industry to maximise the advantages, feasibility and deployment of M-ICT.

The research method used is founded on exploratory multiple case study. Firstly, a framework was developed based on a critical review of previous studies in ICT implementation. This framework was used to inform a qualitative interview guide for investigating case studies. Three live UK infrastructure projects were selected as case studies. Projects selected were at various stages in the construction phase, with varying examples of M-ICT implementations in use. Project participants were interviewed regarding their experiences of the implementation of M-ICT on each project. The participants represented key project stakeholders to offer a wider perspective.

This study identifies different experiences across each project. Single and multiple M-ICT platforms are currently being used, and individual stakeholders are using ICT in isolation and in some instances multiple project stakeholders are using it together. Complete replacement of paper-based processes is evident in some instances, but more commonly, digital technology is being used in parallel to traditional paper processes. The reported benefits of ICT varied; however, overall time saving, information access, improved quality assurance evidence and improved employee performance were consistently cited as benefits of the technology. The challenges, although varied, can be categorised under the themes of: technology, people, process and technical compliance. The findings have been summarised in the M-ICT implementation pre-start recommendation checklist / guideline. It is recommended that this be reviewed at the commencement of each project jointly with all key stakeholders to ensure all key aspects have been considered prior to M-ICT deployment. This will ensure avoidance of common challenges reported in this study and allow the project to take further advantages of M-ICT in the multi-stakeholder infrastructure project environment.

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