

ABSTRACT

Construction industry is an information-intensive and knowledge-based industry, thus, construction organizations need to embrace information technology (IT) to remain competitive. Recent trends demonstrated that improved IT products and services are introduced daily around the world. This phenomenon adds tremendous pressure on construction managers to plan, implement, and adopt new technology solutions to accommodate this fast pace of change in their daily responsibilities and future foresight. Failure to cope with the changes could result to the implementation of obsolete technologies, consequently increasing a risk of overhead and turnover in investing new IT, and as a consequence, reducing competitive advantage. This is evident that organisations must look at technology not only for today but also for tomorrow.

The Malaysian construction industry is lacking of adequate tools to help managers implement IT in dynamic construction environments (CIDB Malaysia, 2011). In this context, the concept of 'Information Technology Infrastructure Flexibility' was created to provide a platform of discussion and solutions for this issue. Based on the its demonstrated effectiveness of faster and more scalable IT, it is believed that flexibility of IT can help construction organizations in handling the rapidity changing IT without the need to re-invest for a new technology. At the moment, this concept remains poorly understood in the Malaysian construction industry and lacked academic research (Fink, 2009; Masrek & Jusoff, 2009).

This thesis aims to provide a practical tool for the construction organizations to assess the advancement of flexible IT infrastructure development. The tool is proposed in a form of maturity model, as this kind of model has gained remarkable benefits by various companies across industries (Software Engineering Institute, 2012).

Critical success factors of the Malaysian construction industry were identified to aim the development of the maturity model. A questionnaire approach was used to facilitate data collection in this research that resulted to the identification of fourteen factors as critical success factors of Information Technology Infrastructure Flexibility – categorized under technical, people, and management dimensions. The next level of research, the significance of each factor was measured against the maturity levels was studied through review of the literature, continued with three organizations participated in the model's validation process. The final product is the *Information Technology Infrastructure Flexibility Maturity Model*.

The model provides construction organizations with a measurement tool for identifying improvements required during the development process of flexible information technology infrastructure. The model also works as a benchmark for internal improvements and assess other organizations as comparison, hence, a useful tool for organizations to determine where there are, and where they aim to be.

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