

**“CAPABILITY NEEDS FOR IMPROVING CONSTRUCTION
PROCESS THROUGH THE APPLICATION OF BIG DATA
ANALYSIS”**

By

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ABSTRACT

This thesis reports a study of big data capabilities for construction firms to equip, and facilitate the efficient management and use of data for construction process improvement. Big data studies in construction are still somewhat limited and this research explores what capabilities construction firms will need to adopt and use big data applications.

The study employs a qualitative research methodology, underpinned by a constructivist's philosophical worldview through phenomenological research design. Interviews were conducted with construction professionals in the Australian Construction Industry with a set of semi-structured questions derived from a review of big data research from across a number of disciplines, including construction. Thematic analyses were performed on the interview data through a two-cycle coding process of structural coding and then pattern coding.

The analyses showed that i) the major benefit of big data applications is in improving the construction process through better decision making; and ii) that there are significant drivers and complications in adopting and using big data applications in construction. Company processes, contract requirements and business strategy were identified as the key drivers of use of big data application, and that the major complications of big data technology adoption focused on people, technology, organisational and environmental issues. These complications are effectively making construction firms struggle in the implementation of big data applications. To address that problem and aligned with identification of these complications, the research data analyses also highlighted 6 sets of capabilities the construction professionals identified as being needed within their organisations, or from outsourcing, for the effective adoption of big data technologies. These capabilities were then integrated into a comprehensive big data capabilities framework for construction managers. That initial framework was then reviewed and validated by a set of construction professionals, data analyst and academics. Their recommendations were then included in a revised version of the capabilities framework.

Keywords: big data application, construction process, big data capabilities, qualitative

