

Developing an Offsite and Onsite Construction Skill and Capability Maturity Scale for SMC Projects



THE JOINING UP CONSTRUCTION CONVERSATION

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1.0 Background

The rapid growth of the construction industry and rising demand in housing and infrastructure facilities in Australia are challenges to the efficiency of Australian construction organisations. In view of the poor quality and under-supply of present day construction practices, the emergence of alternative and new technologies in construction have drawn the attention of many organisations. Globalisation, digitalisation and forces of sustainability are compelling construction projects to adopt more efficient construction technologies.

With this background, the Off-Site Construction (OSC) method has evolved as an efficient alternative approach addressing time, cost, quality and safety concerns of the existing practices. Many construction organisations in Australia have recognised the need to implement OSC methods to achieve competitive advantage. Off-site manufacture is providing and converting the construction industry to reap the benefits of manufacturing sector resulting in varying degrees of offsite manufacture, onsite fabrication and assembly in construction projects. This paradigm shift in production processes is creating fundamental changes in the skills required both onsite and offsite. As a result there are skill redundancies as well as skill gaps emerging.

In order to achieve successful implementation of OSC methods, the construction organisations must be fully aware of the operations and processes involved in working with OSC products, while the organisation itself must be prepared to customise according to the requirements of OSC methods.

2.0 Research Problem

The concept of Off-Site Construction has been drawing more attention from scholars. Various researchers have discussed about the existence of OSC practices worldwide. However, scholars have been less interested in exploring the skill and capability requirements for the transformation of construction approach. There is a need for a framework/methodology to guide the development of skills and capabilities of Australian construction organisations towards the application of OSC approach. This research will address the issues of changing construction skill and capability requirements in construction projects.

This research project will aim to analyse the emerging trends in the transformation of the construction industry and develop a smart modern construction capability maturity scale that evaluate skill requirements for different degrees of offsite manufacturing adoption and SMC. The project will utilise established theories in capability maturity modelling defining key process areas that are core to a typology of SMC.

The project will consider how traditional construction trade packaging and procurement is evolving to elemental procurement and delivery models that involve self-directing multi-skilled assembly teams on and off-site. It will examine the observable weaknesses in how modern construction is not performing as optimally as it may.

The specific objectives of this research are:

- (1) To understand and document the offsite construction paradigm and influencing factors through literature review;

- (2) To investigate the drivers and barriers towards the adoption of off-site construction in Australia and document existing practices in other countries;
- (3) To identify skill and capability requirements for different degrees of offsite manufacturing adoption and SMC;
- (4) To develop capability maturity models for assessing the maturity level and preparedness of construction organisations for adopting Offsite Construction (OSC) practices in Australia.

3.0 Expected Outcomes

This project expects to generate new knowledge in the area of off-site construction approach by providing a novel method to systematically identify and assess the skill and capability requirements for successful application of off-site construction technology in smart modern construction projects. The expected outcomes include the theory development of OSC skill and capability requirements and enhanced capacity of construction organisations to be readily adaptable to the OSC practices. The outcomes can be utilised by the government and industry to address key challenges resulted from adoption of OSC practices in the Australian construction industry.

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