

Project 12: A Digital Framework for Procurement of Offsite Construction within Design for Manufacturing and Assembly(DfMA)

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Procurement of traditional construction projects relies on various parties to work together to complete a project based on pre-defined specifications. Procurement processes are neither entirely onsite nor offsite. Of particular importance is the supply chain to construction sites which are distrustful and antagonistic between operators with the contractor left to deal with many suppliers at the same time. This method is laborious and difficult.

Offsite construction, however, is designed to alleviate or reduce the impact of proliferation of suppliers on the onsite contractor. Offsite construction is the production of components of a building at a factory away from the construction site where they are installed. This also moves the bulk of supply chain from the construction site to the factory where the components are manufactured, and therefore make the procurement to be easily and properly managed.

OSC require highly skilled workers, complex techniques, more complex design considerations, effective communication, and coordination between the stakeholders to ensure deliveries on schedule throughout the project duration. To achieve all these, an appropriate procurement method needs to be selected to guarantee control over the quality of components and safety of the construction process.

This study will examine the advancement of technology to solve problems associated with procurement of materials in the building sector. Therefore, the study will investigate how the procurement of different percentages of OSC varies for the different categories of OSC and identify the problems and issues in each category.

These technical problems of OSC is facilitated by the adoption of Design for Manufacturing and Assembly (DfMA) as a design methodology and the Building Information Modelling (BIM) as a solution to barriers of procurement. Consequently, the study will develop a process of construction and procurement that are carried out seamlessly and in an integrated way.