



Review

Indicators of owner commitment for successful delivery of green building projects



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ABSTRACT

Project owners are very important project participants involved in the delivery of green building projects. By virtue of their commitment, or owner commitment (OC), they can ensure successful delivery of green building projects. However, the indicators of OC are yet to be identified in the literature. As a result, information and knowledge of how OC leads to the successful delivery of green building projects is currently unknown. Therefore, this study carried out a systematic literature of review of 47 scholarly publications in the area of project delivery of green building projects to identify the indicators of OC. Findings reveal 9 indicators of OC, with varying degrees of importance depending on their frequency in the reference sources. The study concludes that there are 9 important indicators of OC. Additionally, the indicators can influence project performance such cost, time, quality and sustainability rating metrics, thereby ensuring successful delivery of green building projects. The findings in this study have implications for project owners of green building projects. Therefore a framework of implementation of OC was proposed. Project owners can apply the framework to guide their commitment from selection of project participants at the design stage to encouragements for improved performance at the construction stage in a sequential manner. Future research should explore and confirm the factor structure of the indicators of OC in order to identify their underlying relationships. In addition, the use and effectiveness of the framework of OC should be validated by utilizing it for practical delivery of green building projects.

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1. Introduction

Building activities such as extraction, processing and transportation of raw materials, design, construction, operation and demolition adversely affect the environment and the ecosystem together (Zou and Couani, 2012) in form of emission of carbon dioxide to the atmosphere (Pheng Low et al., 2014), excessive resources use and wastages, greenhouse gas (GHG) emission (Ozorhon, 2013) and so on. For instance, in the US, buildings account for 38 and 73 percent of all CO₂ emissions and electric energy use respectively (USGBC, 2015). At the same time, building activities hold much promise, with the concept of green building, to reduce: world's energy consumption by 42%, the total GHG by 35%, materials extraction by 50% and water usage by 30% (Commission, 2011). In order to reduce the adverse effect of building activities on the environment and the ecosystem, green building is often employed as the model of building project delivery in the building sector (Hand et al., 2015).

Green building is based on the principle of sustainable construction, whereby constructed products are created by using best-practice, clean and resource-efficient measures from the extraction of the raw materials to the demolition and disposal of its components (Hwang and Tan, 2012; Ojo et al., 2014). As a result, green building projects are constructed with minimum environmental footprint (Waniko, 2012). In addition, they are more resource and energy efficient in their design, construction and use (Korkmaz et al., 2011), and healthier, comfortable and productive during use (Hwang and Ng, 2013). Because of these benefits, green building projects are more attractive and increasingly adopted in the building sector (Korkmaz et al., 2010a,b,c).

According to Olanipekun (2015), the project delivery of green building projects is very complex and difficult. In comparison with traditional building model, green building projects are different in principle, design, construction and operation. In terms of design for instance, an architecture firm may work alone on a traditional project (Palanisamy and Klotz, 2011). However, for a green building project, the architect must closely coordinate their schematic design effort with groups, including mechanical engineers, facilities managers, building occupants, and utility companies (Palanisamy and Klotz, 2011). The complex and difficult project delivery of green building projects affect the delivery performance negatively. In the above example for instance, the interdisciplinary team interaction and decision making between the architecture firm and others may extend the scheduled completion period (Nurul Zahirah et al., 2013). In addition, the use of new technologies and techniques, and environmental-friendly materials attracts very high cost, and their use for green building projects increases the final cost of project development (Hand et al., 2015; Kang et al., 2013; Lapinski et al., 2006; Li et al., 2011). In order to ensure successful project delivery, Korkmaz et al. (2011) suggested that adjustments that can influence the delivery performance of green building projects are necessary.

Owner commitment (OC) – which is the active and deliberate participation and involvement of project owners in the project delivery of green building projects, can influence its delivery performance (Bornais, 2012). As part of the project participants, the

project owners declares the intent, and make the key decisions regarding the project delivery of green building projects (Elforgani et al., 2014; Zou and Couani, 2012). More than other project participants, project owners play the leading role as well as drive the implementation of green building projects (Jarrah and Siddiqui, 2012; Yates, 2014). The commitment of project owners, or OC, is therefore important for successful project delivery of green building projects (Elforgani et al., 2014). However the indicators of OC are yet to be identified in the literature. As a result, information and knowledge of how project owners, through their commitment ensures the successful delivery of green building projects are currently unknown.

Literature review is a useful methodology to gain deeper understanding on, and identifying the current body of knowledge within a research topic (Mok et al., 2015). Hence this study carried out a systematic literature review of 47 scholarly publications in the area of project delivery of green building projects in order to identify the indicators of OC. 9 indicators of OC were identified and described. The discussion of findings mainly addresses the importance of the indicators of OC, and their link to the delivery performance metrics of green building projects. A framework that describes the application of the indicators of OC by project owners in a sequential manner was presented in the conclusion. In order to ensure successful delivery, project owners should apply the framework of OC during the delivery of their green building projects. This study contributes to the body of knowledge on the roles and responsibilities of project owners in the building sector, which according to Elforgani et al. (2014); is currently not attracting much research. In addition, this study contributes to the science of integrating the monitoring and assessment of ecological and environmental indicators with management practices.

2. Building project owners

The meaning of building project owner is not well defined in the literature (Krane et al., 2012), which in some cases, used interchangeably with building clients (Ryd, 2004; Xia et al., 2014). In most cases, project owners are defined on the basis of their interest in building development. According to Krane et al. (2012), building project owners are the financiers, who commissions building projects, and to whom the facility first of all is a strategic asset. On the other hand, they are the end-users who lives, produces or otherwise operates within the facility and to whom the facility is primarily of functional importance (Hartmann et al., 2008). Put together, the project owner is the one who has both the power over the project by financing it (Krane et al., 2012), and consequently, it is the owner whose requirements are to be satisfied and whose core business will be enhanced through the undertaking of the project (Kelly, 2007; Krane et al., 2012).

Towards ensuring the success of conventional building projects, project owners are increasingly involved in the delivery process, an act informed largely by the underachievement in the construction industry in the UK, whereby there were high incidences of project cost and schedule overruns, poor productivity for long period of

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