

Developing a Decision-Making Tool for Prioritizing Green Building Initiatives

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Abstract : Sustainability in built environment sector is subject to many development constraints. Building projects are developed under different requirements of deliverables which makes each project unique. For an owner organization, i.e., a higher-education institution, involved in a significant building stock, it is important to prioritize some of the sustainability initiatives over the others in order to align the sustainable building development with organizational goals. The point-based green building rating tools i.e. Green Star, LEED, BREEAM are becoming increasingly popular and are well-acknowledged worldwide for verifying a sustainable development. It is imperative to synthesize a multi-criteria decision-making tool that can capitalize on the point-based methodology of rating systems while customizing the sustainable development of building projects according to the individual requirements and constraints of the client organization. A multi-criteria decision-making tool for the University of Melbourne is developed that builds on the action-learning and experience of implementing Green Buildings at the University of Melbourne. The tool evaluates the different sustainable building initiatives based on the framework of Green Star rating tool of Green Building Council of Australia. For each different sustainability initiative the decision-making tool makes an assessment based on at least five performance criteria including the ease with which a sustainability initiative can be achieved and the potential of a sustainability initiative to enhance project objectives, reduce life-cycle costs, enhance University's reputation, and increase the confidence in quality construction. The use of a weighted aggregation mathematical model in the proposed tool can have a considerable role in the decision-making process of a Green Building project by indexing the Green Building initiatives in terms of organizational priorities. The index value of each initiative will be based on its alignment with some of the key performance criteria. The usefulness of the decision-making tool is validated by conducting structured interviews with some of the key stakeholders involved in the development of sustainable building projects at the University of Melbourne. The proposed tool is realized to help a client organization in deciding that within limited resources which sustainability initiatives and practices are more important to be pursued than others.

Keywords : higher education institution, multi-criteria decision-making tool, organizational values, prioritizing sustainability initiatives, weighted aggregation model

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