VALUE MANAGEMENT THROUGH A KNOWLEDGE-BASED DECISION SUPPORT SYSTEM FOR MANAGING VARIATIONS IN EDUCATIONAL BUILDING PROJECTS

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Abstract
Value management (VM) in construction is urgently required due to the escalating complexity of building projects. Building projects are complex because they involve many human and non-human factors and variables. VM, if implemented during the early stages, can save costs while maintaining or even improving the performance and quality of construction projects. The integration of project knowledge and experience at the design phase provides the best opportunity to improve overall project performance. This study presents a knowledge-based decision support system (KBDSS) to assist effective implementation of VM for controlling variations in educational building projects. The KBDSS consists of two main components, namely a knowledge base and a controls selection shell, and is developed by collecting data from the source documents of 80 educational projects, a questionnaire survey, and interviews in Singapore.

The system provides an excellent opportunity for the project team to learn from past experiences. The system assists the project team in identifying potential variations and their effective controls during the early stages of construction projects. Furthermore, the KBDSS provides the project team with information on what changes in design can cause to variations. The system also assists in reducing costs and improving designs because the most likely areas in which to focus to reduce variations can be identified early during the design stage of building projects. In short, as part of the VM processes, the system is able to assist the project team by providing accurate and timely information for decision making, and a user-friendly tool for analyzing and selecting the suggested controls for managing variations in educational buildings.

Key words
KBDSS, value management, design improvement, variations, educational projects.

INTRODUCTION

Value is a fundamental term in management. Value is a measure expressed in currencies, efforts, exchanges, or on a comparative scale which reflects the desire to obtain or retain an item, service or ideal (Kelly and Male, 1993). Value management (VM) is a multidisciplinary and team-oriented approach to problem solving (Dell’Isola, 1982). VM, if implemented during the early stages, can save costs while maintaining or even improving the performance and quality of construction projects.

VM in construction is urgently required due to the escalating complexity of building projects. Building projects are complex because they involve many human and non-human factors and variables. Little attention is given to assessing the needs of the clients, stakeholders and those of the design team (Smith, et al., 2001). VM in construction aims to maximize the functional value of a constructed facility to the client.