

## **ABSTRACT**

Abstract of thesis entitled ‘An Investigation of the Feasibility of Using Group Decision Support Systems to Improve Value Management Studies’ submitted by Mr. Chung Kin Hung, Jacky for the degree of Master of Philosophy at the Hong Kong Polytechnic University in January 2002.

There has been a surge of interest in Value Management (VM) applications in Hong Kong’s construction industry since the Asian financial crisis in 1997. However, it is observed that the implementation of VM studies is subject to a number of difficulties and therefore, the benefits of VM are not fully achieved. For these reasons, Group Decision Support Systems (GDSS), which is a branch of information technology (IT), has been introduced to improve VM studies in this research. The research aims (i) to investigate the difficulties in implementing VM studies, (ii) to explore what and how GDSS functions can be applied to improve VM studies, and (iii) to examine their usefulness in the construction industry. Following a comprehensive literature review, a survey has been conducted to investigate the difficulties in implementing VM studies at the first stage of the research. The survey findings report that (i) lack of information, (ii) lack of participation, and (iii) difficulty in conducting the analysis are the most frequently encountered difficulties in VM studies in the construction industry.

At the second stage of the research, a framework of three-dimensional GDSS support has been proposed to illustrate how GDSS technologies can be integrated with VM methodology. The framework suggests that GDSS technologies can provide (i) information support, (ii) communication support, and (iii) analysis support for VM

studies. These supports are further elaborated and developed into a set of GDSS functions in the research.

In addition, a GDSS prototype system called the Interactive Value Management System (IVMS) has been developed based on the proposed framework. The IVMS is comprised of four toolboxes, which are designed to (i) improve collaboration between members, (ii) facilitate information management, (iii) promote exchange of ideas, opinions, and preferences, and (iv) improve the productivity and accuracy of data analysis in VM studies. The IVMS has illustrated how the three-dimensional GDSS support can be integrated and applied to improve VM studies as a computer system.

At the third stage of the research, a validation has been conducted and a group of VM practitioners including (i) VM facilitator, (ii) client, (iii) architect, (iv) project manager, (v) quantity surveyor, (vi) engineer, and (vii) contractor, is invited to evaluate the usefulness of the GDSS functions. The validation results suggest that the three-dimensional GDSS support, in particular the information support and the communication support (technological efficiencies), are highly supportive and they can contribute to (i) improve the effectiveness of presentation, (ii) avoid the conformance pressure in evaluation, and (iii) improve availability of information and enhancing communication in VM studies.

To sum up, the research has successfully applied GDSS to improve VM studies in the construction industry. It explores a new direction of IT application in VM and increases the efficiency and effectiveness of implementing VM studies while maintaining the traditional roles and functions of VM team members.