

## ABSTRACT

Nitithamyong, Pollaphat, Ph.D., Purdue University, December, 2003. Analysis of Success and Failure Factors in Application of Web-Based Project Management Systems in Construction. Major Professor: Mirosław J. Skibniewski.

The use of Web-Based Project Management Systems (WPMSs) is rapidly increasing in the construction industry as it promises to enhance project documentation and control and to revolutionize the way in which a project team conducts businesses. However, the WPMS concept is still relatively new to most construction firms and the usefulness of WPMSs in construction has not yet been proven as promised. Research studies conducted to date usually have aimed to solve existing WPMS implementation problems by introducing new advanced techniques to improve the current systems, but non-technical factors are often considered separately, overlooked, or even ignored completely. It is obvious that a gap exists in our understanding of what factors can influence the success/failure of WPMS implementation.

This study developed and tested an analytical model to capture the success/failure factors of WPMS implementation in construction projects, with a focus on systems that can be rented or leased from Application Service Providers (ASPs) and referred to as Project Management Systems – Application Service Providers (PM-ASPs). The model proposed that characteristics of the project, the project team, the service provider, and the system are among the groups of factors affecting the performance of a PM-ASP in a construction project. The factors associated with each group reflect both concerns from the industry practitioners, as well as factors proposed in the literature as important.

A Web-based questionnaire was developed and used to collect the data, and a total of 82 completed responses from construction projects that were managed utilizing PM-ASPs were analyzed. The results showed partial support for the hypothesized relationships in the model, as well as some contra-hypotheses findings. Three project-level case studies were conducted to illustrate the quantitative findings obtained from the survey, and the findings from the case studies and the survey were

summarized into a series of recommendations that form the basis for a PM-ASP implementation model. The results of this study could help construction-related organizations that are currently using or planning to implement PM-ASPs gain a better understanding of the important factors that need to be considered to ensure the success of PM-ASP implementation and thereby lead to an improvement of PM-ASP utilization, management, and acceptance in the construction industry.