

# THE ADOPTION OF SOFTWARE PROCESS IMPROVEMENT (SPI) PROGRAM IN THE CONSTRUCTION INDUSTRY

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## ABSTRACT

*Integrating the design process and automating the construction process are called for in the Industrialised Building System (IBS) Roadmap 2003-2010 and the Construction Industry Master Plan (CIMP) 2006-2015. Hence, the industry needs to improve the construction delivery process by having as many processes utilizing advanced IT/ICT technologies. With a goal of producing zero product failure and meeting the users' requirement satisfaction, this is an initial study into automating the construction tasks by studying a systematic process management commonly used for software implementation. We present a feasibility study on the use of a Software Process Improvement (SPI) Program in an IT organization—assuming that the construction organization will become an implementer of computer-integrated procedures in the future. Based on a case study conducted at a local IT software company, it documents the implementation of a SPI program to improve the internal software process development. The study uses the Capability Maturity Model Integration (CMMI) from Software Engineering Institute as SPI framework and IDEAL model-SPI life cycle model for executing and managing SPI program. Results show that the SPI Program model is successful in terms of the IT organization increasing its work productivity, high end-user product satisfaction and reduction of software defects. The paper concludes with discussions on how we can bridge computer science approach into the construction industry, thereby contributing to the development of future theoretical and application methodologies towards applying IT/ICT initiatives in the local construction industry.*

**Keywords:** Software Process Improvement, Automation in Construction, Integrated Design Management

## 1. INTRODUCTION

Integrating the design process and automating the construction process are called for in the Industrialised Building System (IBS) Roadmap 2003-2010 and the Construction Industry Master Plan (CIMP) 2006-2015. Hence, the industry needs to improve the construction delivery process by having as many processes utilizing advanced IT/ICT technologies. With a goal of producing zero product failure and meeting the users' requirement satisfaction, this is an initial study into automating the construction tasks by studying a systematic process management commonly used for software development. In this paper, we present a feasibility study on the use of a Software Process Improvement (SPI) Program in an IT organization—expecting that the construction organization will become an implementer of computer-integrated procedures in the future. Our concern is the feasibility of SPI implementation in a discontinuous organization (Ibrahim, 2005) which places the construction organization as a very dynamic organization and operating in a very dynamic environment. Discontinuous members in the construction organization enter the project team when needed, and leave the team when their tasks are completed (ibid.). Based on a case study conducted at a local IT software company, it documents the implementation of a SPI program to improve the internal software process development.

Nowadays, SPI has become one of the dominant approaches to improve quality and productivity in software engineering (Aaen et al., 2001). Based on the total quality management (TQM) principles as taught by Shewhart, Juran, Deming and Humphrey, "The quality of a product is largely determined by the quality of the process that is used to develop and maintain it." The aims of SPI program in IT industry are to reduce development costs through improved developer productivity and to improve end user satisfaction with the resulting software by reducing software defects (McGibbon, 1999). Thus, for managers