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EFFECT OF INFORMATION SYSTEMS IN POSTWAR CONSTRUCTION

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This Dissertation was submitted to the Department of Civil Engineering
of the University of Moratuwa in partial fulfillment of the requirements
for the Degree of Master of Science in Construction Project

Management.

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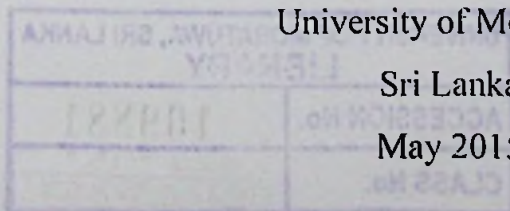
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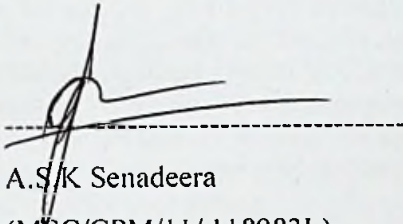
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DECLARATION

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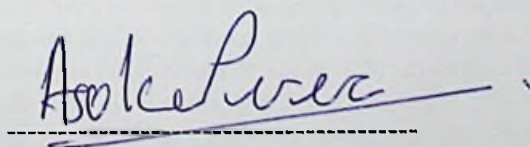


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This is to certify that this thesis submitted by A.S.K Senadeera is a record of the candidate's own work carried out by him, under my supervision. The matter embodied in this dissertation is original and has not been submitted for the award of any other degree.



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Date: 22 May 2015

ABSTRACT

Military Engineering was known to humankind from the Roman era and there after empires were created with ingenuity of military construction projects such as Great Wall of China and Castles in Europe. Reconstruction projects undertaken by the military always follow concepts that specialize in criteria governed by the Militarized theories. Further, Information Technology has helped to bridge the gap of project management tools and techniques to enhance productivity in most effective and efficient manner. Most of the manufacturing oriented organizations in Sri Lanka are shifting towards the modernization and reaping the benefit of Information Technology. The use of Information Technology for specialized projects such as post-war reconstruction projects is considered groundbreaking in the Sri Lankan context. This study will reveal the insights of using Information Technology for Project Management in projects undertaken by the military during the post-war era of Sri Lanka.

The main objective of the research is to analyze productivity improvement and information availability in post-war construction that can be achieved with Information Systems. To achieve the objectives of the research, literature review compiled to identify barriers of construction project management, real impact of IS on performance of project deliverables and major issues in physical infrastructure reconstruction and construction undertaken by military. Literature review begins with war theories and the great events of history, which totally changed the way of human life through civilization. Systematically the study moves into the nature of projects undertaken by the Military. The Project Management aspects in Construction are severely scrutinized to capture the theoretical background of proper Project Management and challenges. It further elaborates the theories which govern the role of Military in post war scenarios including the internal and external forces. On the other hand use of Distributed Information Systems and their benefits were comprehensively reviewed to set the basis for the research.

The methodology derived was two folded. Case study based analysis of a construction project undertaken by the military was the main focal point while the outcomes were strengthened by expert reviews. The data analysis was carried out with the real time data of the selected case which was "Defence Headquarters Complex Project" which is constructed by the defense forces of Sri Lanka. The data captured in to a real Enterprise Resource Planning System with comparisons between manual processes. The industry experts were selected from a pool of professionals considering several key attributes. The analysis was carried out in parallel with the manual processes and professional review. After capturing considerable amount of real time data the outcomes were derived.

The analyzed data were tabulated and compared based on key attributes such as time benefit and information availability under six knowledge areas namely asset, time, cost, reporting, finances and stores management. The conclusion derived from the analysis clearly illustrated that time reduction achieved in all knowledge areas under study is greater than 83.4%. The increase of information depth in managerial and operational levels are greater than 73.3% and 60.8% respectively in all knowledge areas considered for research study. The analysis was meticulous on the basis that the comparison was made real time with exact environment. The conclusions derived from the analysis clearly illustrated the level of efficiency made available with use of Distributed Information Technology Systems and further enhanced with the professional reviews.

Sri Lanka, as a developing nation will be able to reap the benefits of Information Technology with the correct usage and application. Although the Military Construction Projects are considered unique in several aspects, the analysis illustrates that Information Technology can be successfully utilized to enhance the key aspects of Project Management such as Time, Cost and Quality. This study can be further extended to analyze many influential aspects such as human behaviour towards Information Technology Systems and Technological Behaviour in Sri Lanka.

ACKNOWLEDGEMENT

This research would not have been possible without many people who have helped along the way, both in a formal and informal capacity. First and foremost, I would like to express my appreciation and sincere gratitude to my supervisor Prof. A.A.D.A.J. Perera, Department of Civil Engineering, University of Moratuwa having faith in me and giving me an opportunity to conduct research under his supervision. His insightful advice, constant support, encouragement, and guidance throughout the research with great enthusiasm were a tremendous help for me to complete the research.

Secondly, I would like to thank Eng. Samudaya Nanayakkara and Mr. Prasad Perera for their continual guidance, support and encouragement and paving path for completing this dissertation not only educational and enlightening but fun too.

My deepest gratitude goes to Dr. Lesley Ekanayake, Dr. Rangika Halwatura for providing me valuable guidance during the period of the research and academic studies. I would like to thank Mrs Kanthi Menike and staff of Division of Construction Management, University of Moratuwa for their assistance.

I would not hesitate to thanks board of directors of M/S Sapere (Pvt) Ltd offering me the opportunity to use Enterprise Resource Planning System free of charge until completion of my research.

I am grateful to all the professionals from Sri Lanka Army, Sri Lanka Navy and Retired General Manager of Central Engineering Consultancy Bureau, Eng. CS Soysa taking out their time from their busy schedule to share their knowledge with me and providing necessary guidance for me to make my dream come true.

I am also in debt to the Staff of the Defence Headquarters Complex Project Akuregoda who has shared their valuable knowledge and time with me. Also my staff helped me entering data to the Enterprise Resource Planning System for analysis.

Final thanks go to my family, especially to my wife, Noeline Senadeera, my son Sanuja Senadeera and daughter Tharushika Senadeera whose continual support encouraged me to complete the thesis.

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LIST OF ABBREVIATIONS

BPR	: Business Process Re-engineering
CMU	: Construction Management Unit
CPM	: Construction Project Management
CPI	: Cost Performance Index
EIS	: Executive Information System
ERP	: Enterprise Resource Planning
EVA	: Earned Value Analysis
EVM	: Earn Value Method
GoSL	: Government of Sri Lanka
GRN	: Good Receive Note
HTTP	: Hypertext Transfer Protocol
ICT	: Information and Communication Technology
IS	: Information Systems
IST	: Internet Service Provider
IT	: Information Technology
LTTE	: Liberation Tigers of Tamil Elam
MIS	: Management Information System
MOD	: Ministry of Defense
MRP	: Material Requirement Planning
NATO	: North Atlantic Treaty Organization
OSS	: Open Source Software
PDF	: Portable Document Format
PHP	: Hypertext Processor
PM	: Project Management
PMU	: Project Management Unit
SaaS	: Software as a Service
SAP	: System Application Programme
SCM	: Supply Chain Management
SEM	: Systems Engineering Management
SLA	: Sri Lanka Army
SLAF	: Sri Lanka Air Force
SLN	: Sri Lanka Navy
TPS	: Transaction Processing System
WBIS	: Web Based Information System
USAID	: U.S. Agency for International Development