DEVELOPMENT OF A MODEL TO EVALUATE ADVANCED PLANNING AND SCHEDULING SYSTEM IMPLEMENTATION PROJECTS IN MANUFACTURING ORGANIZATIONS

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Degree of Master of Engineering in Manufacturing Systems Engineering

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University of Institute of higher learning and to the best of my knowledge and belief if does not contain any material previously published or written by another person except where acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature: Date: 20.08.2024

The above candidate has carried out research for the Master's thesis under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Dr. L.U. Subasinghe

Signature of Supervisor: Date: 20/08/2024

ACKNOWLEDGEMENT

First my unquantifiable gratitude and appreciation are due to my supervisor Dr. Lihil Subasinghe who gave me guidance and direction throughout the majority of my research study. Dr. Lihil generously dedicated his valuable time by providing substantial expertise and insight toward the success of this research study. Furthermore, gratitude and appreciation are towards Dr. Hirushie Karunathilake who was my original supervisor for this study. Dr. Hirushie guided me into the correct direction at the initiation of the research by allocating time out of her schedule in a consistent manner. Moreover, my sincere gratitude goes towards Mr. Mohamad Naeem who is my co supervisor for this study and coached me in the right direction by exposing me into the digital transformation of manufacturing and advanced planning and scheduling where my field of study was chosen from.

I am grateful to all the experts who took valuable time out from their schedules to support my research by communicating their expert knowledge through taking part in the surveys attached to this study. Furthermore, I am grateful to the 3 companies who took part in the case studies of this research.

I could certainly not have achieved this without the continuous love and support of my wife, my mother and father and my sister. Nothing I can say could adequately acknowledge the contribution they have made to this work.

And lastly my thanks are due to everyone who helped and supported me over the course of my study which led to the completion of this work.

ABSTRACT

Manufacturing organizations are adopting digital solutions to its manufacturing processes with the intention to remain competitive within the industry. The adaptation of such digital solutions impacts various functions within a manufacturing organization and if an Enterprise Resource Planning (ERP) system is taken as an example, such a system impacts all the functions of the organization where it has been configured to use. However, this study is based on Advanced Planning and Scheduling (APS) systems and its implementation. APS systems are made to digitalize the production planning and scheduling function of manufacturing organizations. Advanced Planning and Scheduling (APS) systems are available as a module within some Enterprise Resource Planning (ERP) systems as well as APS systems being available as separate and independent systems. Therefore, this study is conducted on Advanced Planning and Scheduling (APS) systems which are independent from that of an inbuilt ERP module. Furthermore, this study is focused on the implementation aspect of Advanced Planning and Scheduling systems within manufacturing organizations. Digital and technological transformations can be a daunting task for manufacturers. Therefore, when implementing such systems as an Advanced Planning and Scheduling system, it is a standard practice for manufacturing organizations to opt to execute the implementation through a specialized consultation body. Through the literature survey conducted, it is highlighted that a set of critical success factors exist in general when implementing manufacturing operations management systems within manufacturing organizations. Therefore, a further concentrated definition which is subjected to this study is to conduct an in-depth literature review in order to formulate critical success factors associated with the implementation of Advanced Planning and Scheduling (APS) systems within manufacturing organizations. Moreover, through the conduct of this study, the formulated critical success factors and its key performance indicators for the implementation of APS systems will be weighted and prioritized. Hence, the scope of this study is limited to the formulation of critical success factors and its key performance indicators associated with the implementation of Advanced Planning and Scheduling (APS) systems within manufacturing organizations and to formulate the critical success factors and key performance indicators for the implementation of APS systems into an assessment model to evaluate APS implementation projects under each stage of implementation in manufacturing organizations.

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LIST OF ABBREVIATIONS

Abbreviation	Description
APS	Advanced Planning and Scheduling
ERP	Enterprise Resource Planning
PLM	Product Lifecycle Management
MES	Manufacturing Execution System
MRP	Material Requirement Planning
SCM	Supply Chain Management
CSF	Critical Success Factor
KPI	Key Performance Indicator