MODELING OF EFFECTIVE MAINTENANCE FUNCTION FOR MANUFACTURING EXCELLENCE PROGRAMME: A CASE OF MANUFACTURING INDUSTRY IN SRI LANKA

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Degree of Master of Science

Department of Mathematics

University of Moratuwa

Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements for the degree Master of Science in Operational Research

Department of Mathematics

University of Moratuwa
Sri Lanka

February 2013

DECLARATION OF THE CANDIDATE

"I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text"

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DECLARATION OF THE SUPERVISOR

“I have supervised and accepted this thesis for the submission of the degree”

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DEDICATION

This thesis is dedicated to my beloved parents and my loving husband who never failed to aid me with the financial and moral support when required instilling the importance of hard work and higher studies and teaching me that the best kind of knowledge to have is that which is learned for its own sake.

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ABSTRACT

The performance greatly affects the survival and prolonger life time of the manufacturing industry of Sri Lanka. In measuring the corresponding level of performance, the term “productivity” becomes vital. It entails updating the productivity improvement techniques in accordance with the technological advancements of the industry. Manufacturing Excellence programme has become the most updated version of productivity improvement technique. It enhances all the processes, people, goods and information within the work floor providing a good performance in achieving of a higher level of productivity. Since maintenance also has a strategic dimension, its performance measurement system should be linked to the espoused strategy of the function in order to get the maximum impact. It has been clearly recognized the presence of failures in former attempts of implementing productivity techniques due to the unidentified proper maintenance function. This research therefore attempts to develop a suitable maintenance function which describes the relationship between the performance of productivity improvement and different indicators of maintenance practices. Based on this conceptual framework built on successful review of literature related to the area concerned, it was decided to include six performance indicators of the maintenance process into the model. The required data to develop the model was acquired through a structured questionnaire. The model identified that the two significant performance indicators that influence the performance of productivity improvement technique are the extent of training and equipment failure responsiveness. The model was developed through step-wise regression procedure and it was confirmed by both forward selection and backward elimination procedure. As model was developed based on information from one organization it is suggested to develop similar models for other organizations as well.

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KEY WORDS: Productivity Improvement, Manufacturing Excellence Programme, Maintenance Function, Maintenance Practices.

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