

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF LEAN ISO
9001:2008 THEORETICAL
FRAMEWORK USING RASCH
MODEL IN MALAYSIAN FOOD AND
BEVERAGES INDUSTRY**

NURUL SYUHADAH BINTI KHUSAINI

Thesis submitted in the fulfillment
of the requirements for the degree of
Master of Science

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	: Nurul Syuhadah binti Khusaini
Student I.D. No.	: 2011391705
Programme	: Master of Science (EM780)
Faculty	: Mechanical Engineering
Thesis Title	: Development of Lean ISO 9001:2008 Theoretical Framework Using Rasch Model in Malaysian Food and Beverages Industry
Signature of Student	:
Date	: November 2014

ABSTRACT

This study aims to provide a comprehensive Lean ISO 9001:2008 theoretical framework for the organizations in the Malaysian food and beverages industry as a guide to implement Lean Manufacturing based on ISO 9001:2008 clauses. Thus, this study investigates the extent of Lean Manufacturing implementation in the Malaysian food and beverages industry. This study also identified the implementation sequences for both Lean Manufacturing tools and practices to achieve the aim. A survey was conducted and the data were generated based on the production managers' self-rating for all survey questions. Rasch Model was employed to analyze the overall data, as well as the data by construct. Overall reliability analysis revealed that the items are sufficient to measure the organizations' competency level, and was able to separate the respondents to three significant groups namely Leaders, Practitioners, and Followers with a Person mean of -0.67 logit. A negative logit value suggested that Lean Manufacturing is not yet recognizable in Malaysian food and beverages industry. The Person-Item Distribution Map (PIDM) showed that the common Lean Manufacturing practices and Lean Manufacturing tools among the organizations in the Malaysian food and beverages industry are Total Preventive Maintenance (LT16), Root cause analysis (LT17), 5S (LT1), Standardized work (LT8), Setup reduction (PE1), Rigorous preventive maintenance (PE4), Process capability (PE7), Order and cleanliness in the plant (PE8), Continuous reduction of cycle time (PE9), Quality at the source (SR6), Reliable and prompt delivery to customers (CR1), Commercial actions to identify customer preference to stabilize demand (CR2), Capability of sales network from innovative relationship with customers (CR3), Flexibility on meeting customer requirements (CR5), Service-enhanced product (CR6), Multitasking workers (HR1), Worker involvement in continuous quality improvement programs (HR4), Team decision making (HR6) and Innovative performance appraisal and performance related pay system (HR8). Company size was found to have the highest Differential Item Functioning (DIF) items when compared to other demographic traits. The findings revealed that small companies have a build organizational learning system and are currently moving towards Lean Manufacturing. The results had also revealed the sequence of Lean Manufacturing implementation for both tools and practices. These important findings were categorized according to ISO 9001:2008 clauses for the Lean ISO 9001:2008 theoretical framework development. The Lean ISO 9001:2008 theoretical framework acts as guidance for the organizations to implement Lean Manufacturing. Also, the findings provided empirical support that the drawbacks of Lean Manufacturing implementation for all companies are merely on the perception issues. Hence, the organizations in the Malaysian food and beverages industry need to straighten their mindset towards Lean Manufacturing by having a clear company vision and objectives, as well as strategies with the help of the proposed theoretical framework. Future research need to consider the actual implementation of the proposed framework at the organizations within this industry, as well as identifying relevant Lean Manufacturing practices that can fills in the gap as shown in the PIDM.

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The Prophet said, "If anyone fulfills his brother's needs, Allah will fulfill his needs; if one relieves a Muslim of his troubles, Allah will relieve his troubles on the Day of Resurrection." [Sahih Bukhari]

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