UNIVERSITI PUTRA MALAYSIA

ASSESSMENT OF POST-CERTIFICATION OF ISO 14001 IMPLEMENTATION IN MANUFACTURING INDUSTRY IN MALAYSIA

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ASSESSMENT OF POST-CERTIFICATION OF ISO 14001 IMPLEMENTATION IN MANUFACTURING INDUSTRY IN MALAYSIA

By

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the Degree of Master of Science

ASSESSMENT OF POST-CERTIFICATION OF ISO 14001 IMPLEMENTATION IN MANUFACTURING INDUSTRY IN MALAYSIA

By

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December 2017

Chair: Mariani Binti Ho Nyuk Onn @ Ariffin, PhD
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Numerous studies have shown the benefits of ISO 14001 certification in terms of an organization's operational and environmental management performance improvement. However, recent studies question the adoption of this voluntary EMS and the actual improvement achieved through the implementation and maintenance of ISO 14001. This study aims to assess the ISO 14001 post–certification implementation within Malaysia's manufacturing industry. Assessments through identifying the direction and magnitude of the influences of study factors toward ISO 14001 post–certification conformance and investigating the factors that affect such conformance. A total of 186 respondents were selected from the more industrialized states of Selangor, Johor and Penang. A self-administered questionnaire and a follow up interview survey were employed for data collection. The data collected were discussed in terms of respondent profile, company profile and the measurement of study factors using a five point-likert scale. The study factors, including human resources and budget, competent person, top management commitment and perceived benefit, were found to have significant relationship with ISO 14001 compliance, except for management system certification experience. Results of the research provide input for manufacturing industries to improve their conformance level to achieve continual improvement with EMS ISO 14001 system.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PENILAIAN UNTUK PERLAKSANAAN ISO 14001 SELEPAS PENSIJILAN DI KALANGAN INDUSTRI PEMBUATAN MALAYSIA

Oleh

TAY HUI HUI

Disember 2017

Pengerusi: Mariani Binti Ho Nyuk Onn @ Ariffin, PhD
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Terdapat ramai penyelidik-penyelidik yang berminat dan telah mengkajikan sistem ini dari segi faktor pengambilan dan juga faedah-faedah pengambilan sistem ini. Walau bagaimanapun, proses pelaksanaan sistem selepas pensijilan yang juga amat penting pula tidak diberikan perhatian yang mencukupi. Oleh demikian, kajian ini ingin menilaikan pelaksanaan ISO 14001 selepas pensijilan di kalangan industry pembuatan Malaysia. Kajian ini melibatkan seluruh industri pembuatan dari negeri-negeri perindustrian Malaysia, iaitu di Selangor, Johor dan Pulau Pinang. Faktor atau pembolehubah bebas yang dipilih untuk mengkaji adalah sumber manusia dan sumber kewangan, orang yang kompeten, sokongan pengurusan atasan, pengalaman perlaksanaan sistem pengurusan dan kesedaran terhadap faedah-faedah EMS. Manakala pembolehubah bersandar adalah tahap pematuhan pelaksanaan sistem ISO 14001. Populasi kajian meliputi seluruh industri pembuatan ISO 14001 dari negeri-negeri perindustrian Malaysia, iaitu Selangor, Johor dan Pulau Pinang yang didaftarkan di bawah Direktori Persekutuan Pekilang-Pekilang Malaysia (FMM). Sebanyak 186 responden telah dipilih secara rawak daripada Persekutuan Pekilang-Pekilang Malaysia 2015. Data-data kajian termasuk latar-balakang responden, latar belakang kilang dan juga penilaian terhadap fakto pembolehubah telah dikumpulkan melalui soal-selidik dan sesi temuduga. Analisis statistik telah digunakan untuk mentafsirkan data kajian. Kesemua pembolehubah bebas kecuali kekurangan pengalaman perlaksanaan sistem pengurusan telah menunjukkan hubungan yang signifikan dengan pematuhan perlaksanaan sistem ISO 14001.

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I certify that a Thesis Examination Committee has met on 4th December 2017 to conduct the final examination of Tay Hui Hui on her Thesis entitled "Assessment of Post–Certification of ISO 14001 Implementation in Manufacturing Industry in Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the master of science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

AESP	Confined Space Entrant and Standby Competent Person
CCM	Companies Commission of Malaysia
CePSTPO	Certified for Environmental Professional in Sewage Treatment Plant
CePSWaM	Certified Environmental Professional in Scheduled Waste Management
EMS	Environmental Management System
FMM	Federation of Malaysian Manufacturers
GDP	Gross Domestic Product
ISO	International Organization for Standardization
KMO	Kaiser-Meyer-Olkin
NCR	Non-Conformity
PCA	Principal Component Analysis
PDCA	Plan, Do, Check and Act
QMS	Quality Management System
RBV	Resources-Based View
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
RoHS	Restriction of Hazardous Substances
SHO	Safety Officer
SIRIM	Standards and Industrial Research Institute of Malaysia
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Sciences
TDM	Tailored Design Method

CHAPTER 1

INTRODUCTION

1.1 Background of Study

In modern economies, industrialization has claimed to be the motor of economic progress. The growth of manufacturing sector has created employment opportunities, has reduced poverty and has ensured a long-run growth in economic development (Naghi & Szasz, 2010). However, industrial revolution since 18th century does not only changed human standard of living, but also inevitably changed the face of our mother nature. From the tragedies of Love canal, Bhopal accident and Minamata (George, 2003; Johnson & Covello, 2012; Weick, 2010), to the more recent issue of global warming, water supply contamination and biodiversity loss, these are all signposts of the failure in sustainable development and environmental management (Ploutz, 2012). The environmentalism or environmental behavior evolved from nature protection in 19th century to the effort of governmental reform in late 1990s, and finally shift to green investment in the 20th century (Henzri, 2011). A global green market place has been born due to the growing concern towards natural resources depletion and environmental pollution. Current consumer are more mindful of environment relevant issues, obligations and often consider environmental cause over the cost of product. Cronin et al., (2010) emphasized the effort of green market strategic on the aspect of green innovation, greening of organization, green alliance and green customer. A green oriented company should incorporate environmental friendly targets and resources into corporate strategy, practice and promote their green product to consumer. As we move toward a future where eco product and green practices become an essential demand in the market, the role of management team and its internal influence will evolve as well. Organization has to commit in environmental management and contribute to sustainable development in order to remain competitive and succeed in the global green market place (Srivastava, 2007). However, due to the effort of environmental management is not yet an obligatory governmental regime, voluntary management system, such as ISO 14001 is therefore necessary to standardize and govern the operation of green marketing practitioners.

1.2 Problem Statement

ISO 14001 is a voluntary Environmental Management System (EMS) that internationally recognized as management based system for organization-level environmental performance improvement. The system was launched by International Organization for Standardization (ISO) in 1996 (International Organization for Standardization [ISO], 2015). The voluntary standard is well recognized as a benchmark for industrial green revolution and highly contributes to the improvement of industrial environmental management. However, the distribution of ISO 14001 certified firms varies significantly across the globe (Hatch, 2005; Neumayer & Perkins, 2004; Prakash & Potoski, 2007). According to Neumayer and Perkins (2004), adoption of ISO 14001 standard has been greatest in Japan, followed by a number of developed European countries, the US and Australia. Several of developing countries in East and Southeast Asia have also been

rapidly adopting the voluntary management system recent years. In Malaysia, as a developing country where economic activities mainly depend on export oriented industrial, our industrial firms shows an increasing demand for EMS as a result of intensive pressure from consumer demand, local government as well as international requirement to respond to the environmental issues (Zailani et al., 2009). However, despite the high demand and requirement, adoption rate for self-regulated EMS including ISO 14001 in Malaysia is relatively low compared to other Asian countries. The gap of ISO 14001 adoption appear to be widening between Japan, south Korea, Malaysia and other Asia countries (Hatch, 2005). According to The ISO 14001 certifications Survey in Asia countries between 2005 to 2013, Malaysia has been recorded with a lower certification numbers, as compare with China, Japan, India and also Thailand (ISO, 2013b). The design of ISO 14001 has been claimed to address the needs of any type or size of organization, anywhere in the world, many organizations see the EMS as an instrument to achieve the objectives of meeting a growing green market demand and minimizing compliance cost (Tari, Azorin, & Heras, 2012). Several previous studies have been conducted locally and globally to study on its adoption factors and benefits to boost up the adoption rate (Albertini, 2013; Goh, 2011; Zailan et al., 2009). However, in the aspect of post –certification implementation process, only a little literature available about the real experiences, both good and bad of the organizations tackling its implementation problems and successes were found (Hillary 2001). The absence of implementation information was also emphasized by Inno (2005), who stated that "the main external barrier for ISO 14001 was lack of sector specific implementation information and examples". Joussineau (2013) also highlighted the obstacles in implementing ISO 14001 as lack of set guidelines for objectives and targets setting and how to accomplish continuous improvement of standard.

ISO 14001 is a continual improvement system, initial certification will not guarantee any significant improvement towards environmental protection or conservation (Heras-Saizarbitoria et al., 2013; Lannelongue et al., 2015 and Vera, 2016). In fact, several previous studies have shown the possibility of variations between the development and implementation of ISO 14001 and that these variations can significantly affect the achievement of improvements in environmental performance. The subsequence processes after adoption, which includes post – certification implementation and maintenance of the system, are equally important to determine the contribution and effectiveness of such voluntary system (King et al., 2005 and Yin & Schmeidler, 2009)

1.3 Research Objectives

The general objective of study is to assess the post – certification compliance of ISO 14001 based on a survey conducted on a sample of ISO 14001 certified manufacturing firms that operate in the industrialized states of Malaysia: Selangor, Johor and Penang.

The specific objectives are:

1. To identify the direction and magnitude of the influences of study factors toward ISO 14001 post-certification compliance within Malaysia's manufacturing industry.
2. To investigate why and how the study factors affect the ISO 14001 post – certification compliance within Malaysia's manufacturing industry.

1.4 Research Hypothesis

The following research hypotheses were developed to test on the significant factors that affect the post – certification compliance of ISO 14001:

Research hypothesis, Ha1:	There is significant relationship between human resources and budget and the ISO 14001 post-certification compliance in Malaysia manufacturing industry.
Research hypothesis, Ha2:	There is significant relationship between competent person and the ISO 14001 post-certification compliance in Malaysia manufacturing industry.
Research hypothesis, Ha3:	There is significant relationship between voluntary management system implementation experience (ISO 9001) and the ISO 14001 post-certification compliance in Malaysia manufacturing industry.
Research hypothesis, Ha4:	There is significant relationship between top management commitment and the ISO 14001 post-certification compliance in Malaysia manufacturing industry.
Research hypothesis, Ha5:	There is significant relationship between perceived benefit and the ISO 14001 post-certification compliance in Malaysia manufacturing industry.

1.5 Significance of Study

Through investigate the significant factors that affect ISO 14001 post - certification compliance, this research could serve as references for organization with variety of profile to tackle its post – certification implementation problems and thereby enhance the performance of EMS. Further, this study also discussed the post - implementation of ISO 14001 in terms of planning, implementation and operations, checking and monitoring and management review to provide guideline for the existing ISO 14001 implementers to improve the development of their EMS mechanism.

1.6 Scope of Study

This thesis is structured into five chapters.

In chapter 1, introduction of research explained the development of manufacturing industry and its impact on environment, evolution of environmentalism, the growth of global green market demand and the need of voluntary EMS. The problem statement emphasized on ISO 14001 adoption trend and the absence of literature on post – certification implementation and maintenance. Research objective and hypothesis were established while the significance of study was also discussed here.

Chapter 2 elaborate on the literature and relevant publications on the topics studied. The chapter further divided into sub-topic to further discuss on ISO 14001 implementation and maintenance, Plan, DO, Check and Act (PDCA) cycle, compliance and adoption trend, adoption factors and Malaysia manufacturing industrial. The literature on methodology including selection of survey method also discussed in this chapter.

The methodology of study presented in chapter 3 covers the establishment of research theoretical framework, sampling design, process of data collection and the statistical approach selected for both quantitative and qualitative data analyses. Also explained are the pilot studies conducted to test for the reliability of questionnaire items established this study.

In chapter 4, result for quantitative and qualitative data analysis were presented align with the accomplishment of research objectives. Questionnaire and interview survey overall response rate were discussed, followed by the analyses of population demography, including respondent and company profile to show the frequency and distribution of survey respondent population. This chapter also examined the survey data descriptive statistics and relationship between independent and dependent variables through hypothesis testing. Findings from the series of follow up interviews were presented to provide further insights into the survey findings.

The last Chapter 5 presented the conclusion of overall research findings. This chapter also put forward some recommendations for further research based on the limitation of the findings of current study.

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