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Motivating Factors in the Implementation of ISO 14001 in the Packaging Industries in Northern Region of Peninsular Malaysia

Chai Tew Ang and Norhashimah Morad*

Environmental Technology Division, School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia

ABSTRACT

This research is conducted to identify a number of factors that motivates an organization to adopt the ISO 14001 standards. This study is conducted amongst the packaging industries within Northern Region of Peninsular Malaysia. The local industries support the adoption of the ISO 14001 Standard as the Malaysian Standard in 1998 and its revision in 2004. However, the awareness on the importance of the ISO 14000 series standards intended for the industries is still limited. The results from the questionnaire survey show that there are 81% of the companies aware of the ISO 14001 standards but only 23% of them are ISO 14001 certified. The mean value calculated indicates that *concern of top management to the environment* is the main motivating factor to implement the ISO 14001 standards. It is followed by *meeting clients' needs* factor, *enhancement of corporate image and credibility* factor, *improving competitive edge* factor, *overcoming trade barriers* factor, *conforming to head office environmental practices* factor, *potential cost savings and benefits* factor, *improvement of employee welfare in the area of environmental health* factor and finally *meeting Malaysia's environmental regulations* factor. Among the motivating factors, only *meeting clients' needs* factor and *conforming to head office environmental practices* factor show the significant impact to the ISO 14001 standard certification. It is due to the small sample size of data used in the statistical analysis. Finally, the motivating factors are ranked according to their strengths obtained in the statistical analysis.

Keywords: motivating factors, ISO 14001 standards, packaging industries

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E-mail addresses:
carol.ang8@gmail.com (Chai Tew Ang),
hashima@usm.my (Norhashimah Morad)
* Corresponding author

INTRODUCTION

The environmental problems that we confront have expanded from local and regional to global. Resource consumption and environmental emissions originating

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from industrial activities pose serious threats to human health and the stability of the ecosystems. Therefore, adopting environmental management is the most effective way for organization to deal with global environmental regulations. By April 2005, more than 88000 facilities worldwide have certified their Environmental Management Systems (EMS) to ISO 14001, the global EMS standard (Peglau, 2005) and thousands more have adopted uncertified EMSs. EMSs are strategic management approaches that define how an organization addresses its impacts on the natural environment (Darnall et. al, 2008). Environmental management is considered as a vital tool for the survival of the organization in the 21st century. In this study, a survey based on questionnaire has been conducted to identify factors that influence the decisions of a company, located in Malaysia, in implementing the ISO 14001 standards. The survey is concentrated on the packaging industries within Peninsular Malaysia. The aim of this study is to identify factors that motivate an organization to adopt the ISO 14001 standards. The subsequent seven sections of this paper are structured as follows:

1. research hypotheses;
2. literature review;
3. material and method results;
4. finding;
5. discussion; and
6. conclusion.

RESEARCH HYPOTHESES

The objective of this study is to investigate whether the factors i.e., *Overcoming trade barriers (V1), Concern of top management to the environment (V2), Potential cost savings and benefits (V3), Enhancement of corporate image and credibility (V4), Improvement of employee welfare in the area of environmental health (V5), Meeting clients' needs (V6), Improving competitive edge (V7), Conforming to head office environmental practices (V8)* and *Adopting ISO 14001 standards as part of Malaysia's environmental regulations (V9)* Motivating the company to adopt ISO 14001. There are a total of 9 predictor variables (V1 to V9) in this study. Thus, the null hypotheses and alternative hypotheses are developed as the following:

$H_0 : \beta_1=\beta_2=\beta_3=\beta_4=\beta_5=\beta_6=\beta_7=\beta_8=\beta_9=0$
$H_1 :$ At least one β is not zero

The null hypothesis claims that there is no significant correlation at all. It means that all of the coefficients (β_1 to β_9) are zero and none of the variables (V1 to V9) belongs in the predicted model which is the intention of ISO 14001 standard certification. The alternative hypothesis is not that every variable (V1 to V9) belongs in the model but that at least one of the variables belongs in the predicted model which is the intention of ISO 14001 standard certification.

LITERATURE REVIEW

This study attempts to identify factors that motivate companies to pursue ISO 14001 certifications. The considered factors are

overcoming trade barriers, *concern of top management to the environment*, *potential cost savings and benefits*, *enhancement of corporate image and credibility*, *meeting clients' needs*, *improving competitive edge*, *conforming to head office practices* and *meeting Malaysia's environmental regulation*.

V1: Overcoming Trade Barriers

Malaysia is a developing country that has been exporting the packaging products to most of the developed countries like the US, Europe, Japan and etc. According to Cascio *et al*. (1996), if the ISO 14001 standards are applied strictly, these requirements have the potential to bar most manufacturers from developing countries from exporting their products. It is believed that the ISO 14000 series may become a barrier to international trade. From a survey based on the 1997 United Nations Industrial Development Organisations (UNID) on 351 organisations, it is found that 53% of the organisations agree or strongly agree that foreign environmental standards already hinder export opportunities (Harrington & Knight 1999). Thus, it is interesting to discover whether this is one of the motivating factors in implementing the ISO 14001 standards in Malaysia.

V2: Concern of Top Management To The Environment

According to a survey conducted by Berry and Rondinelli (1998), top management leadership has been identified as one of the six critical elements that is required to create an effective proactive environmental management. A study by Gupta (1995) reports that 92% of the 400 CEOs and top executives surveyed agree that the environmental challenge is one of the central issues of the 21st century. Thus, this study enables us to determine whether the concern of top management to the environment is one of the crucial factors in adopting the ISO 14001 standards.

V3: Potential Cost Savings And Benefits

Hughes (1996) argues that a good EMS can pinpoint opportunities for cost savings in the area of raw materials, waste minimization or elimination of pollution, and energy efficiency. However, a study of five ISO 14001 companies in Singapore indicates that the benefits of EMS implementation far exceed the costs in the long run (Quazi at el. 1999). Our study continues to examine how far is this perception to the companies in Malaysia that intend to implement the ISO 14001 standards.

V4: Enhancement of Corporate Image And Credibility

Johannson (1995/1996) argues that ISO 14000 series standard shall promote better business, maintain good public or community relations and enhance image and market share. According to Haklik (1997), a 1990 Gallup poll discovers that 52% of those surveyed discontinue buying products from companies with poor environmental image. The auditing and monitoring process in the certified company ensures that the quality of environmental management

system is maintained leading to increase of its credibility in the global view. Therefore, enhancement of corporate image and credibility has been identified as a possible motivating factor of the ISO 14001 standard certification in the packaging companies in Malaysia.

V5: Improvement of The Employee Welfare In The Area Of Environmental Health

A study by the Asia Environmental Office of Sony International shows that the introduction of EMS has a positive effect on employee recruitment where it helps attracting capable employees (Chan 1997). Piasecki *et al*. (1999) states that no matter how compelling a corporate vision, no matter how effective a quality blueprint and no matter how clear a policy integrates technology and environment, there are of no value unless teams of individuals are personally committed to making a difference in performance. The extent of AT&T's success is due to its employees around the world taking their environment and safety responsibilities personally.

V6: Meeting Clients' Needs.

Businesses are becoming increasingly conscious about environmental management. They now prefer engaging suppliers with good environmental records. Clients who are concern of their reputation and environmental compliance requirement often choose to use suppliers or sub-contractors who are able to demonstrate satisfactory environmental performance (Kazemiekzyk 1996). Back in 1989, a study reports that ISO certification is positively related to customer satisfaction (Saraph et. al 1989). The survey by Ofori *et al*. (2001), reports that the companies seek for ISO 14001 standard certification if clients demand it and end-purchasers insist on environmentally friendly products.

V7: Improving Competitive Edge.

According to Graff (1997), market is the primary factor that drives companies to institute an EMS. Evidently, it has been shown in a survey of 99 businesses in the US on the reasons behind their intention to seek certification which reveals that 50% of the respondents cite customer demand and improved competitive position as the two primary factors that drive them towards gaining an ISO 14001 certification. Besides this, market pressure is also one of the strongest reasons for competitive advantage over non-certified companies. It creates pressure for the non-certified companies to become certified. Parallel to the ISO 9000 experience, ISO 14000 series of standard certification may be needed to fulfil contractual requirements or a condition of placing a purchase order. Some companies may only engage certified subcontractors (Ritchie & Hayes 1997).

V8: Conforming To Head Office Environmental Practices.

Basically, the pressure to introduce Total Quality Management (TQM) in an organization comes from two basic origins. The first origin of pressure is the corporate headquarters and the second origin is from

the leading customers who have already introduced TQM programs. Such customers increasingly demand the same from their suppliers (Hunter & Beaumont 1993). Similar situations may follow in the case of ISO 14000 series standards. For example, motor industry giants like Ford and General Motors wield their enormous power on their component part suppliers to conform to ISO 14001 EMS as a precondition to do business and expect all its subsidiaries to abide as well (Moretz, 2000; Schaarsmith, 2000).

V9: Meeting Malaysia's Environmental Regulations.

Since Malaysia has shifted from an agricultural to a manufacturing based industry, toxic cleansers and hazardous materials are becoming a concern on environmental and health problems. Without proper disposal facilities, the only solution is to either stockpile the wastes in barrels on factory grounds or resort to illegal dumping. The Environmental Quality (Schedule Wastes) Regulations 1989 lists 107 different categories of toxic substances and attempts to ensure that hazardous waste generators are responsible in disposing their wastes at the Bukit Nanas Waste Management Centre in Negeri Sembilan for proper treatment, burial or incineration (SAM 2001). Under these regulations, a licensing and approval system is implemented to control firms that are involved in such activities. The Department of Environment (DOE) monitors the emissions and discharge of pollutants by industries through a self-monitoring system imposed on industries, conducting spot checks and sampling.

MATERIALS AND METHOD

A total of 210 questionnaires are distributed to all the listed packaging companies in the "FMM Directories", "PDC Directories", "Perbadanan Kemajuan Negeri Kedah companies address booklet" and "Perbadanan Kemajuan Negeri Perak companies address booklet, i.e. all the certified and non-certified packaging companies in the Northern region of Peninsular Malaysia.

The questionnaire comprises of two parts: Part 1 focuses on the demographics, while Part 2 focuses on the research questions of interest. In Part 2 of the questionnaire is designed based on 40 questions which are related to nine possible motivating factors. The respondents are asked to rate these statements based on a five-point Likert scale in which 5 = strongly agree and 1 = strongly disagree. In addition to the statements addressing the issues related to the factors, the respondents are also asked to provide information related to ISO 14001 standard certification status and the plans to get certified. Background information on their respective organizations is also requested.

To minimize response biasness, the statements are randomly jumbled for example the statements belonging to a particular factor are not grouped together. However, the data analysis statements belonging to each of the nine possible motivating factors are grouped together and analysed accordingly (Table 1). The Statistical Package for Social Science software is used to analyse the reliability and validity of the results. Multiple regression analysis is also performed to identify the

most significant factor contributing towards ISO 14001 standard certification. Finally, the intended motivating factors will be ranked according to the calculated mean values.

TABLE 1
Grouping of The Statements Under Various Motivating Factors

Motivating factors	Statement no.
V1 = Overcoming trade barriers	6, 8, 23, 24, 27
V2 = Concern of top management to the environment	2, 4, 5, 10, 15
V3 = Potential cost savings and benefits	1, 7, 9, 26, 28
V4 = Enhancement of corporate image and credibility	33, 38, 39
V5 = Improvement of employee welfare in the area of environmental health	11, 12, 14, 35
V6 = Meeting clients' needs	17, 19, 21, 22, 30
V7 = Improving competitive edge	13, 32, 34, 36
V8 = Conforming to head office environmental practices	20, 25, 29, 31, 37
V9 = Adopting ISO 14000 series standard as part of Malaysia's environmental regulations	3, 16, 18, 40

RESULTS AND FINDINGS

Descriptive Analysis

Out of the 50 participating companies, only 43 respond with complete answers. Unanswered questions are treated as "missing data" and excluded from the analysis. The results obtained from the 43 copies of survey forms show that 58% of the respondents are purely packaging companies, 33% packaging and manufacturing companies and 9% of printing and packaging companies. 29% of the companies responded are from multinational corporations, and 71% are small-medium enterprises with a net asset of less than RM2.5 million. 71% are ISO 9001 certified. 81% (35) are aware of ISO 14001 standards although only 23 % (10) are certified. The results are illustrated in Fig.1. However, 54% (23) indicate their intention to adopt ISO 14001 standards and 38% (16) of the respondents are practicing EMS.

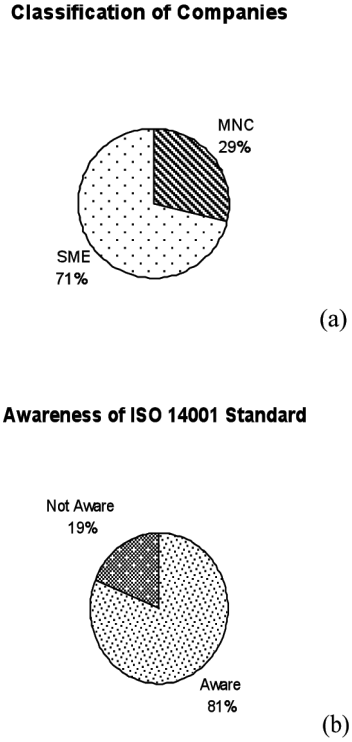

Fig.1: (a) Classification of companies
(b) Awareness of ISO 14000 series standard

Reliability Analysis

According to Sekaran (2000) a reliability coefficient (Cronbach's alpha value) of 0.6 or above is considered as adequate to reflect the validity of measures of the variables used in the questionnaire. The Cronbachs' alpha values range from 0.5280 to 0.7901 as shown in Table 2. To enhance the internal consistency, one item each from V1 and V7 are deleted. Therefore, we can accept that the above variables are reliable indicators of ISO 14001 standard motivating factors as all of them have a reliability coefficient of above 0.6.

TABLE 2
Results of Reliability Analysis

Variables	Cronbach's Alpha	No of items removed	Cronbach's Alpha [after the removal of one item]
V1	0.5990	1	0.6251
V2	0.7017	-	0.7017
V3	0.7145	-	0.7145
V4	0.7078	-	0.7078
V5	0.7901	-	0.7901
V6	0.6455	-	0.6455
V7	0.5280	1	0.6369
V8	0.7108	-	0.7108
V9	0.7004	-	0.7004

The results show that Null Hypothesis is rejected; there are differences between all the 9 motivating factors in seeking for ISO 14001 standard certification. Table 3 presents the results of the multiple regression analysis. The results of the multiple regression analysis show that two of the motivating factors, *meeting clients' need (V6)* and *conforming to head office environmental practices (V8)* are significant at 5% level. It indicates that V6 and V8 are factors that drive a company to seek ISO14001 standard certification. The results of multiple regression analysis can be concluded in the predicted model in Equation 1. Y is a dependent variable which indicates the degree of motivation for a company to seek ISO14001 certification. In this study, we attempt to predict the degree of motivation by relating to the identified motivating factors (V1 to V9):where, Y-intercept or constant is (-0.472); β_6 is the unstandardized coefficient on the predictor variable V8 is (+0.231); and β_8 is the unstandardized coefficient on the predictor variable V8 is (-0.260).

$$Y = -0.472 + 0.231\ V6 - 0.260\ V8 \quad \text{(Equation 1)}$$

Equation 1 indicates that V6 *meeting clients' need* is the factor that shows positive impact towards the response of getting the ISO 14001 standard certification in packaging industries within the area of study. However, V8 *conforming to head office environmental practices* is the factor that brings a negative impact on the ISO 14001 standard certification in its implementation. It may be due to the fact that most of the packaging industries are locally established as small-medium enterprises (SMEs) and that they either do not have any headquarters or they do not need to comply with their head office environmental practices. Thus, the factors that lead them to the ISO 14001 standard certification are based on their own environmental awareness. In addition, some

other motivating factors related to meeting clients' needs and conforming next to head office environmental practices should be identified and explored in depth in the next study. Besides, the same motivating factors may also be tested in different industries in the future research.

TABLE 3
Results of Multiple Regression Analysis

Independent variables	Unstandardized Coefficients β	Significant (P value)
V6=Meeting clients' needs	0.231	0.045
V8=Conforming to Head Office environmental practices	-0.260	0.023
R squared = 0.337 Significant (P value)= 0.093		

The R-squared for all the motivating factors taken together are considered to be fairly low (33.7%) as shown through the results of the multiple regression analysis. In some fields, it is entirely expected that the R-squared values to be low. For example, any fields related to predicting human behavior, typically have R-squared values lower than 50% (Blog Minitab, 2013). Despite of having low R-squared value (33.7%), we can still provide an indicative result on how changes in the predictor values are associated with changes in the response value, as we find 2 significant coefficients for V6 & V8 in this study. Independent of the R-squared value, the significant coefficients still represent the mean change in the response for the change in the predictor while holding other predictors in the model constant. Obviously, this type of information can still be valuable. In other words, the motivating factors taken together can explain 33.7% of the variation of ISO 14001 standard of certification in packaging industries within Peninsular Malaysia with the probability value significant at 10% level. Therefore, the motivating factors can be predicted by using equation 1.

Finally, these motivating factors are ranked according to the mean values based on the respondents' opinion on the important motivating factors in getting the ISO 14001 standard certification. The results are shown in Table 4.

TABLE 4
Summary Results of Mean Value

Factors	Mean value
V2 = Concern of top management to the environment	4.0651
V6 = Meeting clients' needs	4.0512
V4 = Enhancement of corporate image and credibility	3.9302
V7 = Improving competitive edge	3.7752
V1 = Overcoming trade barriers	3.7500
V8 = Conforming to Head Office environmental practices	3.7070
V3 = Potential cost savings and benefits	3.5023
V5 = Improvement of employee welfare in the area of environmental health	3.4709
V9 = Meeting Malaysia's environmental regulations	3.2907

The results of this study indicate that *concern of top management to the environment* is the main motivating factor of ISO 14001 standard implementation. Besides, *meeting clients' needs* factor, *enhancement of corporate image and credibility* factor, *improving competitive*

edge factor, *overcoming trade barriers* factor and *conforming to head office environmental practices* factor are respectively ranked from important to least important factors in the ISO 14001 standard implementation. Whereas, *potential cost savings* factor, *improvement of employee welfare in the area of environmental health* factor *and meeting Malaysia's environmental regulations* factor are the least motivating factors towards the standard implementation. Fig.2 shows the mean values of the motivating factors indicating the intention to get the ISO 14001 standard certified.

DISCUSSION

The factors that are be able to predict the motivation in adopting the ISO 14001 standard of packaging industries have been investigated and identified. Although 210 questionnaires are posted, only 43 responses with full answers are obtained. The responses obtained are sufficient for the model prediction according to Roscoe (1975) proposes that the sample sizes greater than 30 are appropriate for most research. The mean values obtained from the Likert scale indicate that the identified motivating factors are agreeable by the packaging industries within the area of study. Based on the descriptive analysis, although the mean values, that is from 3.2907 to 4.0651, show slight difference between these motivating factors, it can still be ranked according to its popularity. The correlation coefficient test and multiple regression analysis show that there are significant differences among those motivating factors.

Based on the descriptive analysis, the highest mean value of 4.0651 indicates that most of the respondents agreed with the *concern of top management to the environment* as the most important factor that motivates them to adopt the ISO 14001 standard certification. A survey conducted by Nanyang Technology University in Singapore (Quazi *et al.* 2001) and Shanghai Jiaotong University (Zeng *et al.* 2005)

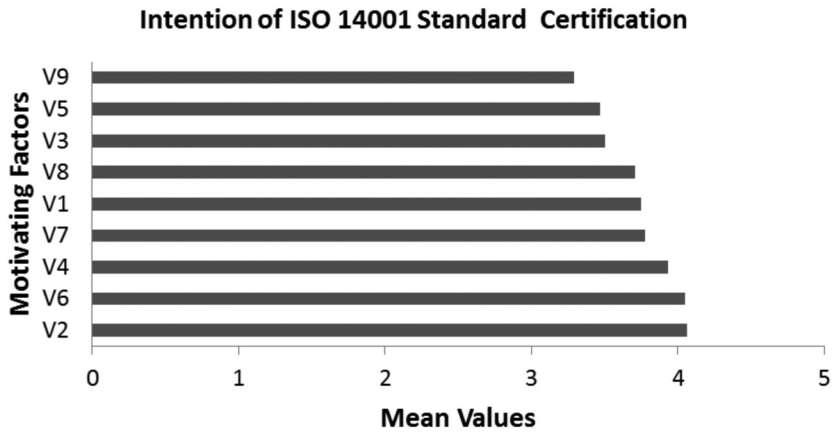

Fig.2: Mean Values of The Motivating Factors Indicating The Intention To Get The ISO 14001 Standard Certification

supports this result; the *concern of top management* is the most important factor for their predictive model development of ISO 14001 standard certification. The second ranked motivating factor is *meeting the client's needs*. Other researches seem to support this result. For example, a study conducted by Perez-Sanchez *et al.* (2003) on Small and Medium Enterprises (SMEs) in United Kingdom and Lee (2009) on the Korean SMEs, both conclude that increase of customer pressure or demand is the main drivers for green management. Meanwhile, e*nhancement of corporate image and credibility* is ranked third followed by *improving competitive edge*. A survey conducted by Maliah & Nik Nazli (2002) shows that enhancement of the corporate image is the main factor for companies seeking the ISO 14001 standard certification in Malaysia in the year 2002. Although *overcoming trade barriers* is the reason for most of the companies to be considered before the ISO 14001 standard implementation, it seems not to be a major driver in this study due to its fifth rank. Meanwhile, motivating factors like *conforming to head office environmental practices*, *potential cost saving and benefits*, *improvement of employee welfare in the area of environmental health* and *meeting Malaysia's environmental regulation* are ranked from the important to least important based on the survey results. Surprisingly, *meeting Malaysia's environmental regulation* is ranked last. This may be due to the lack of motivation from the government in enforcing the ISO 14001 standard as part of the governmental regulation. The adoption of the ISO 14001 standard is still very much a voluntary exercise by industries in Malaysia. , An accredited certification body such as Standards and Industrial Research Institute of Malaysia (SIRIM) may play a significant role in disseminating information on ISO 14000 to the industries in order to improve the number of certified ISO 14000 companies in Malaysia. This information can motivate the industries to understand the benefits that come with this certification and subsequently pursue the ISO 14000 certification (Razuan & Suhaiza, 2013).

As mentioned earlier, correlation coefficient test and multiple regression analysis used in this study is to ensure the reliability and validity of the results. In continuation of such consideration, we find that *meeting clients' needs*, *enhancement of corporate image and credibility* and *improving competitive edge* are among the motivating factors that have a significant positive correlation with ISO 14001 standard certification. However, based on the multiple regression performed on all the factors, only two motivating factors have been identified as significant. The factors are *meeting clients' needs* and *conforming to head office environmental practices*. Only *meeting clients' need has* a significant positive impact on the companies seeking for ISO 14001 standard certification. Meanwhile, the motivating factor of *conforming to head office environmental practices* has a significant negative impact on the ISO 14001 standard of implementation. In this

case, it may indicate that it is not necessary for ISO 14001 standard certified companies to follow their head office environmental practices as they are more interested in meeting their clients' requirements.

The number of respondents is poor in this study. No doubt, larger respondents shall reflect more accurate results. However, indicative results obtained in this study seem to align with other studies (Tan, 2005), (Maliah *et al*., 2002) and (Razuan & Suhaiza, 2013).

CONCLUSION

This research is conducted to identify factors that are considered as important motivating factors for packaging companies in Peninsular Malaysia in adopting the ISO 14001 standard. Various statistical analyses are conducted on the sample collected. The mean value of the nine factors obtained indicate that that *concern of top management to the environment* is the main motivating factor, followed by *meeting clients' needs* factor. The lowest ranked factor is *meeting Malaysia's environmental regulations*. On the other hand, based on the multiple regression performed on all the factors, only two motivating factors have been identified as significant. The factors are V6 *meeting clients' needs* with the positive significant impact and V8 *conforming to head office environmental practices* with the significant negative impact.

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