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## **DOCTOR OF PHILOSOPHY**

**The moderating and mediating effect of the environmental management control systems on environmental performance : the case of Malaysian hotel sector**

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**The Moderating and Mediating Effect of the Environmental  
Management Control Systems on Environmental  
Performance: The Case of Malaysian Hotel Sector**

**By  
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**A Thesis Submitted to the Bangor University  
in Fulfilment of the Requirements for  
the Degree of Doctor of Philosophy**

**Bangor Business School  
Bangor University  
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## ABSTRACT

This study seeks to contribute to the field of environmental management and management control literature as the study resolves the existing conflicts in the literature regarding environmental management practice and at the same time develops a theoretical foundation for the management control system in the framework of the environmental management perspective. This study also introduces the moderating and mediating framework to enhance the understanding of the contingent factor related to the practice-control relationship in the environmental management perspective. Previous studies such as Henri and Journeault (2006) and Baba (2004) examined environmental management practices within manufacturing firms, thus ignoring the significant impact of the service-based sector on environmental problems. Building from Simons's (1995) four levers of management control system, this study examines empirically the influence of environmental management control systems on environmental performance in the hotel sector. This study used questionnaires and phone interview surveys to collect the data. Linear regression analysis and hierarchical (moderated) multiple regression analysis are used to analyse the data. Environmental management practice and four elements of management control systems, i.e. interactive control systems, budgeting control systems, environmental information systems and cultural control systems, are considered to have a significant influence on environmental performance. Size, structure and chain are also included in the model as control variables. The results indicate that management control systems are not necessarily applicable in assisting hotel management to enhance their environmental performance. The budgeting control system was the only management control element which directly influences environmental performance. Environmental management practice is found not to have a direct significant effect on environmental performance. However, the results reveal that the budgeting control system and interactive control system mediate the relationship between environmental management practice and environmental performance, while the environmental information system and cultural control system moderate the relationship. The results of the study are expected to have implications on the awareness in the hotel sector of how important it is for hotels to practise environmental activities beyond-compliance and integrate them with management control systems to improve their environmental performance.

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## LIST OF ABBREVIATIONS

ENVMGT	Environmental management practice
ENVPERF	Environmental performance
INTERACTIVE	Interactive control system
BUDGET	Environmental budgeting control system
EIS	Environmental information system
CULTURE	Environmental culture
EMCS	Environmental management control system
ACCA	The Association of Chartered Certified Accountants
NGOs	The non-governmental organisation
CICA	The Canadian Institute of Chartered Accountants
IFAC	The International Federation of Accountants
LADA	Langkawi Development Authority

## Introduction

### 1.1 Study Overview

Over the past decade, firms world-wide have come under increasing pressure to conduct their business in a more open and responsible manner. This pressure forces firms to move to a new strategy which can be defined as sustainable development<sup>1</sup>. The ACCA (Association of Chartered Certified Accountants) (2003) mentioned that within the framework of sustainable development, firms can continue making a profit while concentrating on safeguarding the environment according to rules and regulations.

According to Schaltegger et al. (2003), many countries, for over 30 years, have debated the issues of managing environmental problems in their eco-system agenda. Schaltegger et al. (2003) mentioned that firms are forced by their stakeholders to be more alert to monitoring environmental impact and they must ensure that their activities do not harm or negatively impact on the environment. The debate on the issues of monitoring the environmental impact in business, however, is still continuing and is still unresolved (Baba, 2004).

The idea is that keeping all the firms' activities on track towards achieving their environmental and economic objectives would help bring firms to monitor the environmental impact through their activities. Thus, in order to control and monitor the environmental impacts on the real world, the function of management control

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<sup>1</sup> The concept of sustainable development is been discussed in depth in subsection 3.2.4. This concept generally focuses on the three core areas; economy, social and environment. The concept was introduced in the report 'Our Common Future' by the World Commission on Environment and Development (i.e. The Brundtland Commission Report, WCED) in 1987.

systems within the environmental framework must be one of the management priorities they should be concerned about.

However, generally, research of how management control systems influence environmental management practice in order to enhance the environmental performance is still sparse. Furthermore, Simons (1990) argues that the extent better management practice leads to better performance is still being studied and needs more extensive research to understand the situation. With regards to the discrimination of the management control system's role in the relationship between practice and performance in environmental management, no work has been identified to confirm the study of such relationships.

For these reasons, this study moves one step forward to study the role played by management control systems in the relationship between environmental management practice and environmental performance. Since this study is an exploratory study, there is no intention to develop such measurement on environmental performance. The environmental performance is measured by adapted a subjective measurement as developed by Carmona-Moreno et al (2004) and this measurement will be discussed in Chapter Five.

## **1.2 Problem Statements**

According to Hobson and Essex (2001), even though firms adopt proactive action to prevent environmental impacts through formal standards such as ISO 14001, firms' environmental performance is still not as satisfactory as expected. Delmas (2002)

mentioned that even though ISO 14001's motive is to improve environmental performance within firms, success in improving is not guaranteed.

Baba (2004) mentioned that, businesses may realise the impact of not monitoring environmental problems very well and consequently may adopt and take proactive action to prevent environmental problems from occurring, such as conducting environmental training and putting pollution prevention into planning. However, Baba (2004) reports that not many firms in Malaysia are entitled to receive an award such as the Hibiscus award<sup>2</sup> and that only a few firms are certified with the formal ISO 14001 standard. Yet, Malaysia is still facing pollution problems, such as forest fires, road congestion and water pollution (The Malaysian Business Times, 2007, 17 May), although many efforts had been made to increase awareness among firms.

According to Hassan et al. (2006), the most challenging task in Malaysia is to convince small and medium scale enterprises to shift from an old to a new environmental management perspective<sup>3</sup>. Environmental management practice remains separated and isolated from the traditional core business strategy and management system (Baba, 2004). According to Ahmed et al. (2003), the traditional perspective shows that environmental concerns affected firm's overall performance because firms need to put in extra investment by using more than the usual amounts of resources to achieve better environmental performance. For example, requirements

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<sup>2</sup> The Hibiscus award is an award introduced by the Malaysian Prime Minister to reward firms that have good environmental management practice. This award is given in detail in footnote #8, subsection 2.2.

<sup>3</sup> Old environmental management practice refers to the end-of-pipe approach and new environmental management refers to the practice based on voluntary initiatives (beyond-compliance activities).

may include an extra amount of investment to install a new technology in order to prevent environmental pollution.

Furthermore, it is also difficult to evaluate environmental performance from environmental reporting because there is no specific report for environmental matters in Malaysia. Even though most of the firms in Malaysia nowadays are aware of the importance of some form of health, safety and environmental reporting (ACCA, 2005), Deegan and Gordon (1996), Jaggi and Zhao (1996) and Fekrat et al. (1996) stated that environmental information in voluntary reporting is not sufficient to represent the actual events or problems. According to Deegan and Rankin (1996), reporting is only based on positive and subjective events. This situation makes it difficult for stakeholders to evaluate the environmental performance of firms. This voluntary basis was also one of the factors which hindered firms from taking note of the importance of environmental reporting to the stakeholder (Jaafar, 2001). Thus, without proper environmental information, environmental performance is likely not to be improved. This situation might also be due to a lack of an absolute requirement for environmental performance in ISO 14001 (Delmas, 2002).

On the other hand, the impact of environmental management practices on environmental performance is not conclusive. As of now, there are conflicting results from one study to another. For examples, Carmona-Moreno et al. (2004), Klassen and McLaughlin (1996) and Russo and Fouts (1997) found a positive relationship between environmental strategy and performance while other studies such as Cordeiro and Sarkis (1997) detected a negative or an insignificant relationship. Benito and Benito (2005) suggested that the conflicting findings were explained by the different methods



of measurement used in the different literatures. Therefore, apart from focusing on the different types of measurement, this study suggests that it is fruitful to put more emphasis on examining whether the contradictory findings of the previous studies regarding the relationship between environmental management practice and environmental performance is influenced by the role of the management control system in implementing the practice. While the relationship between management practice, management control systems and performance, in general, has already been researched and documented, such as Anthony and Govindarajan (2001), Langfield-Smith (1997) and Simons (1995, 1990), there is considerably less empirical evidence on the role played by management control system on performance. For example, Simons (1995) did not clarify explicitly the role played by management control system on performance.

However, looking at the environmental management and management control literature, it seems that research into whether management control systems are useful within the environmental management framework has, until now, been very limited. According to Nilsson and Rapp (1999), not many firms integrate environmental management activities with management control systems. Schaltegger et al. (2003) suggested that environmental management should be integrated into core business processes, tools, decision making and accountability. As Merchant (1985) suggests that failure to integrate environmental management activities into other activities such as the management control system will lead to ineffectiveness in environmental performance. Even though recent studies, such as Henri and Journeault (2006) examine the influence of management control systems on environmental performance, they do not clearly identify the role played by the management control system.

Up to now, there has been no study carried out to identify the role of the management control system within the relationship between practice and performance from the environmental management perspective. Therefore, this study has been done in order to examine whether environmental management practices have a significant relationship to environmental performance acting through management control systems or the role of management control systems in environmental concern which affects environmental performance. Since this study is not to examine the extent the environmental performance will improve, there is no intention to develop any measurement for the environmental performance.

Previous studies such as Henri and Journeault (2006) have examined environmental management control practices within manufacturing firms, thus ignoring the significant impact of the service-based sector on environmental problems. As most of the empirical studies in Malaysia on environmental management practices, such as Baba (2004), Romlah et al. (2002), Jaafar (2001) and Foo and Tan (1988) focused on firms listed in the Bursa Malaysia (that is manufacturing or construction industries), this study extends the practice to the service-based industry, i.e. the hotel sector. By focusing on service firms operating in developing countries, such as Malaysia, this study helps to advance an understanding of environmental management practice beyond its normal focus on the manufacturing and industrial sectors.

Building from the Simons' (1995) four levers of control framework, namely belief system, diagnostic system, boundary system and interactive system<sup>4</sup>, this study is

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<sup>4</sup> Simons' lever of control framework is discussed in detail in Chapter Three.

exploratory in that it examines the influence of environmental management control systems on the relationship between environmental management practice and environmental performance and currently, to the author's knowledge, there is no documented or published empirical research to date that has examined these relationships in the hotel sector.

Based on all the issues mentioned above, some of the research questions are given below:

1. What is the role played by management control systems on environmental management practices in order to improve environmental performance? Does the management control system moderate the relationship between environmental management practice and environmental performance? Do the environmental management activities enhance or reduce the explanatory power of environmental performance acting through the management control system?
2. Are the contradictory findings of the relationship between environmental management practice or strategy and performance because of a lack of a management control system or as a result of other factors? Can the relationship between practice and performance in manufacturing firms be applied to the hotel sector? Does the size of the hotel, structure and chain affiliation affect the practice of environmental management and management control system in the hotels?

3. What is the current environmental management practice in the hotel sector in Malaysia? Are the hotels in Malaysia aware and conscious about the importance of managing and monitoring environmental impacts?

### 1.3 Objectives of the Study

In general, this study aims to examine the influence of management control systems on the relationship between environmental management practice and environmental performance. This study seeks to identify whether the management control system and each of its elements moderate or mediate<sup>5</sup> the relationship between environmental management practice and environmental performance. The moderating effect happens when the level of a third variable influences or affects the degree of the relationship between two variables, while the mediating effect occurs when the relationship between two variables is influenced through the acting of third variables. Four elements of management control systems; i.e. interactive control system, budgeting control system, environmental information system and cultural control system, are examined to determine whether they have a significant influence on environmental performance in the hotel sector.

Specifically, the research objectives are:

- a) To examine the relationship between each of management control system elements and environmental performance.
- b) To examine the relationship between environmental management practice and each of management control system elements.

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<sup>5</sup> Moderate and mediate relationship is discussed in detail in Chapter Six.

- c) To examine the relationship between environmental management practice and environmental performance.
- d) To investigate current environmental management practice in the hotel sector in Malaysia.

#### **1.4 Motivation and Significance of the Study**

There are several factors that serve as motivation to conduct the current study and some theoretical and practical contributions that may be offered by the current study.

First, previous literature on the environmental management perspective, such as Delmas and Toffel (2005) and Henriques and Sadosky (1999) only focused on the determinant factor of environmental practice and environmental performance by using stakeholder theory to explain the situation. While Baba (2004) examined the relationship between environmental management practice and environmental performance to see the extent that small-medium firms are responsive to environmental problems. Those studies were not looking at the internal perspective such as whether or not the internal control system influences the relationship. Furthermore, the subject of the study has been little explored and up to now, there is no established framework of management control systems in the environmental management literature.

Therefore, one of the distinctive contributions of the study is to the field of environmental management and the management control system. The aim of the study is to resolve the existing conflicts in the literature regarding environmental management practice and at the same time, to develop theoretical foundations to place

the management control system in the framework of the environmental management perspective. In addition, the use of the hotel sector as a unit of analysis will also add knowledge to the hospitality literature.

Second, previous studies such as Henri and Journeault (2006) and Simons (1990, 1995) did not differentiate the role of the management control system on practice and performance. Therefore this study contributes to the theoretical perspective by establishing the conceptual framework by showing the link between environmental management practice, management control systems and environmental performance. The moderating and mediating framework also contributes to the enhancement of understanding the contingent factors related to the practice-control relationship in the environmental management perspective.

Third, the study also contributes to the methodology perspective. This study employs a survey questionnaire to collect data and follows with an in-depth phone interview survey to clarify the issues raised by the questionnaire survey results. This method according to Creswell and Clark (2007) is known as a sequential explanatory mixed method. By using this method, the qualitative data and their analysis refine and explain those statistical results by exploring participants' views in more depth (Creswell and Clark, 2007; Creswell, 2003).

Fourth, this study may contribute to the practicality perspective. The study offers ways for the public and private sectors to implement an environmental management control system in their business. Furthermore, the study can also show firms in

general and the hotel sector, in particular, the importance of practising environmental activities beyond-compliance to improve their environmental performance.

### 1.5 Summary of the Findings

The findings of this study can be summarised as below:

- 1) The management control systems which were implemented in the hotel sector were not necessarily applicable to assist hotel management in enhancing their environmental performance. The hotel sectors should use the appropriate management control system in order to improve environmental performance. From the selected elements of the management control system, only the budgeting system appeared to be likely to influence environmental performance. The budgeting system and the interactive control system appear to mediate the relationship between environmental management practice and environmental performance. Whilst the environmental information system and cultural control system moderate the relationship.
- 2) Environmental management practice appears to influence the management control systems. This finding suggests that the implemented management control system is actually contingent on the practice and an appropriate management control system is likely to affect environmental performance. Besides that, environmental management practice also appears to influence environmental performance but it depends on other factors such as size and structure. In addition, since the hotel sector is a service-based industry, chain affiliation appears to have an influence on environmental management practice.

- 3) The elements of the management control system are more likely to be inter-related. For example, the study found that the interactive control system did not influence the environmental performance because of the resistance of people in the hotels to adopting a new culture which might cause knowledge and skill not being well spread. This could lead to ignorance for top management and employees and stop them participating actively in environmental practice. However, when considering interactive control system as a mediating variable to the relationship between environmental management practice and environmental performance, it appears to have a significant impact on enhancing environmental performance.
  
- 4) The environmental management practices in the hotel sector in Malaysia are still at an early stage and most of the activities related to environmental problems are only concerned with the activities which are considered as bottom line activities. Large hotels are more likely to be involved in waste audit, total cost accounting and pollution prevention activities

The research findings are further discussed in Chapter Six and Chapter Seven



## 1.6 Organisation of the Study

The organization of the study follows a standard thesis format and the content of the document is organised into seven chapters. Chapter 2 reviews the current status of environmental problems in Malaysian industry. The rules and regulations and the authorities responsible in relation to environmental management practice in Malaysia are also highlighted. Chapter 3 reviews the literature on the issues of environmental management and management control systems. The concept underlying the environmental management and management control system are also discussed. Also, this chapter highlights the variables that are subjected to testing.

Chapter 4 outlines the conceptual framework and hypotheses development. Based on the literature review in Chapter 3, this chapter discusses the theoretical model and constructs. Chapter 5 focuses on the research methodology. As this study utilises a sequential explanatory mixed method, using a questionnaire and followed by the interview approach, questionnaire development and the administration of data collection are given emphasis. Issues relating to sampling procedures and controllability of variables are discussed. This chapter also explains how the research variables are operationalised and incorporated into a questionnaire.

Chapter 6 is dedicated to testing hypotheses and to presenting the analysis of the data. It focuses on presenting and discussing a range of descriptive statistics, correlation and multiple regression analyses that were generated as the basis for understanding the characteristics of environmental management practices in the hotel sector in Malaysia. This chapter also further explores the relationship between environmental

management practices, management control systems and environmental performance. The findings from the interview survey related to the issues raised by the questionnaire survey results are also mentioned in this chapter.

Chapter 7 offers an in-depth discussion and summarises the study's findings in relation to the relevant previous literature. Finally, Chapter 8 outlines implications for both research and practices, and qualifies the results within the frame of theoretical and statistical limitations. The study concludes with the assumptions and the limitations of the study, suggestions for future avenues of research and final thoughts regarding this and similar studies within the domain of environmental management and management control systems.

## **The Current Status of Environmental Issues in Malaysia**

### **2.1 Introduction**

Environmental issues in Malaysia have been discussed since 30 years ago (JICA, 2002) when Malaysia first incorporated their environmental concerns into the Third Malaysia Plan (1976 to 1980). Malaysia, as like many developing countries, exhibits a considerable number of environmental problems (Perry and Singh, 2001) such as loss of wildlife habitats, soil erosion and air and water pollution. The rapid growth of Malaysian economic development has lead to an increase in urbanisation and has caused serious environmental problems in the country, such as land congestion and destruction of the natural surroundings (Sham, 1999).

This chapter highlights the current status of environmental issues in Malaysia, particularly, the impact of environmental issues on the tourism industry. The laws and the legislation related to the environment are also discussed.

### **2.2 The Environmental Issues in Malaysia**

Malaysia has faced several environmental problems related to urbanisation and rapid growth of population in industry. The Udenrigsministeriet's (2007) report states that the most prominent environmental problems at the moment are caused by industrial pollution, such as hazardous waste and land development. This report confirms the statement given in the Environmental Quality Act (1998) that major pollution such as hazardous waste is likely to be the principal industrial pollution problem in future years. New controls on hazardous waste were included in the Environmental Quality (Amendment) Act 1996.

Perry and Singh (2001) reported that the number of environmental offences prosecuted under the Environmental Quality Act has increased in Malaysia. In 1998, the number of penalties was imposed and increased by almost 50 percent to 253, when compared to 130 cases in 1992. On the other hand, the number of public complaints concerning environmental issues also increased during 1990. The increases in public complaints lead the media to put the issues forward and at the same time raise public awareness of environmental issues. The government of Malaysia has also establish environmental policies more substantial and concrete in the Fifth Malaysian Plan (1986-1990) and the Sixth Malaysian Plan (1991-1995) to monitor and manage the issues.

JICA (2002) also stated that Malaysian government has stated the objectives of Malaysia's national environmental policies in the Seventh (1996-2000) and the Eighth (2001-2005) Malaysian Plans. For instance, the Eight Malaysian Plan discussed the developments and the prospects for the environment and the management of natural resources from 2001 to 2005. JICA (2002, 4) stated that the Malaysia's national environmental policies are meant *'to achieve a clean, safe and healthy living environment for current and future generations, and to promote lifestyle and modes of production and consumption consistent with the principles of sustainable development'*.

Currently, based on the Udenrigsministeriet's (2007) report, the government of Malaysia also has placed further emphasis on preventive measures to mitigate and minimise negative environmental effects at source, to intensify conservative efforts and to ensure sustainable development in the Ninth Malaysian Plan (2006-2010).

In relation to the tourism industry, as reported by the Bernama (2006, March 31), the Ninth Malaysian Plan also includes a strategic thrust in order to enhance the Malaysia position as an international tourist destination as follows:

- Ensuring sustainable tourism development
- Enhancing development of innovative tourism products and services
- Encouraging and facilitating domestic tourism
- Intensifying marketing and promotion activities
- Enhancing human resource development
- Ensuring comfort, safety and the well being of tourists

Malaysia government also realises the importance of taking care of environmental problems and has thus set up a department to handle environmental problems, which is, the Department of Environment (DOE) under the auspices of the Ministry of Science, Technology and Environment (MOSTE). At the same time the government of Malaysia has adopted ISO 14001 and ISO 14010 through the application of standard in any activities which related to environmental problems, such as MS ISO 14001 and MS ISO 14010. Both of the standards were prepared by the National Sub-Committee on environmental management systems and environmental audits under

the authority of the National Committee on Environmental Standards. SIRIM<sup>6</sup> 2000 stated that the standards are applicable to all types and sizes of organisations operating an environmental management system.

The Malaysian government has also set up the Industrial Research Institute of Malaysia (SIRIM) and environmental NGOs such as Environmental Management and Research Association of Malaysia (ENSEARCH) and Sahabat Alam Malaysia (SAM) has also established to become involved in environmental management and educate the public on the importance of the environment and assist communities which are affected by environmental degradation. Furthermore, SIRIM has been involved in establishing standards, certification, testing, inspection, calibration and implementation of other relevant schemes.

According to Perry and Singh (2001), in Malaysia, the government has seen ISO 14001 as an important indicator of voluntary business commitment to environmental improvement. The NGOs also play an important role in encouraging environmental protection in Malaysia and according to Sham (1999), the NGOs have become a 'public watchdog' for environmental care.

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<sup>6</sup> SIRIM is similar to the British Standards Institute (BSI) in that it is an implementing agency for standardisation and a core body in development of national standards and certification system in Malaysia. In 1996, the organisation was accredited by the Malaysian Accreditation Council as the first standards certification body in Malaysia (Baba, 2004).

Perry and Singh (2001) reported that the Malaysian International Chamber of Commerce and Industry (MICC) established an environmental committee in 1992. The MICC plays an important role in ensuring that organisations meet the requirements to obtain environmental awards, such as the Prime Minister's Hibiscus Award<sup>7</sup>. Perry and Singh (2001) reported that in 2000, only 39 firms met the criteria for the award. On the other hand, the ACCA website reports that the ACCA Malaysia Environmental and Social Reporting Award (MESRA) were also launched with the aims of:

- Giving recognition to those organisations which report and disclose environmental and social information,
- Encouraging the uptake of environmental and social reporting, and
- Raising awareness of corporate transparency.

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<sup>7</sup> The Prime Minister's Hibiscus Award was first launched in 1996 by the Honorary Prime Minister of Malaysia, YAB Dato' Seri Dr Mahathir Mohamad, and was endorsed by the Ministry of Science, Technology and Environment, Malaysia (MOSTE) and supported by the Department of Environment (DOE) and the private sector. The award is jointly organised by four non-profit organisations concerned with corporate environmental issues, namely:

- Business Council for Sustainable Development in Malaysia (BCSDM)
- Environmental Management and Research Association of Malaysia (ENSEARCH)
- Federation of Malaysian Manufacturers (FMM)
- Malaysian International Chamber of Commerce and Industry (MICCI)

The specific objectives of the Award are to:

- Provide business and industry with the opportunity of an independent evaluation of their environmental commitment
- Stimulate business and industry initiatives in assuming a proactive role in environmental protection, and
- Recognise the achievements of exemplary participating organisations for other similar organisations to emulate

The three level of achievement and award are as follows:

- Notable achievement in environmental performance
- Exceptional achievement in environmental performance
- Excellent achievement in environmental performance

According to JICA (2002), the environmental issues faced by the Malaysian industry are mostly monitored by specialised government organisation. Table 2.1 highlights the relevant government organisations that are responsible for monitoring each environmental problem. From the table, the most important environmental issues faced are the water pollution and solid waste and most of the issues are monitored by the MOSTE<sup>8</sup>.

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<sup>8</sup> MOSTE is the Ministry of Science, Technology and Environment.



**Table 2.1:  
The Relevant Governmental Organisations Responsible for Various Environmental Problems Area**

Environmental issues Governmental organisation	Air pollution	Water pollution	Noise	Marine pollution	Solid Waste	Energy	Water supply	Waste water	Forest conservation	Bio-diversity	Natural resources	Natural disaster	Environmental education
MOSTE	O	O	O	O	O	-	O	O	O	O	O	O	O
MMS, MOSTE	O	-	-	-	-	-	-	-	-	-	-	NA	NA
Road Transport Department, Ministry of Transport	O	-	NA	-	-	NA	-	-	-	-	-	-	-
Geological Survey Department, Ministry of Primary Industries	-	O	-	-	-	-	-	-	-	-	-	-	-
Marine Department, Ministry of Transport	-	O	-	O	-	-	-	-	-	-	-	-	-
Local Government Department, Ministry of Local Government and housing	-	-	-	-	O	-	-	-	-	-	-	-	-
Water Supply Department	-	NA	-	-	-	-	O	O	-	-	-	-	-
State Public Works Department	-	-	NA	-	-	-	O	-	-	-	-	-	-
Department of wildlife and National Parks, MOSTE	-	-	-	NA	-	-	-	-	O	O	NA	-	NA
Department of Forestry, Ministry of Primary Industries	-	-	-	-	-	-	-	-	O	NA	NA	-	-
Ministry of Education	-	-	-	-	-	-	-	-	-	-	-	-	O
Local Government	NA	NA	NA	NA	O	NA	NA	NA	NA	NA	NA	NA	NA
Ministry of Energy, Telecommunication and Post	NA	NA	NA	NA	O	-	-	-	-	-	O	-	O

Source: Planning and Evaluation Department, JICA (2002) O: Relevant organisation -: Not responsible NA: No information

### 2.2.1 Environmental Issues in Malaysian Tourism Industry

According to the report from the ESCAP Tourism Review (2001), the tourism industry has become a vital vehicle for a number of countries in Asia and the Pacific Region, including Malaysia, to boost their economic and social development. Based on information from the report, the tourism industry has the potential to generate income, create jobs, reduce economic imbalance between countries and reduce the poverty problem. For example, the World Travel & Tourism Council (WTTC) (2007) reports that the Malaysian travel and tourism industry is expected to generate MYR117.2 billion (US\$33.6 billion) of economic activity (total demand) in 2007 and expected to contribute 4.4 percent to Gross Domestic Product (GDP) in 2007 (i.e. MYR26.4 billion or US\$19.3 billion) (WTTC, 2007). WTTC (2007) also reports that the Malaysian travel and tourism industry is forecast to have generated 476,000 jobs in 2007, contributing for 4.5 percent of total employment for Malaysia.

However, this forecasting and expectation might be true with regards to economic development, but is not always true in terms of balancing the cost-benefit effects. This cost-benefit concept is referring to the concept of sustainability which balances the trade-off of environmental value for social and economic value. According to Radha (2004), with the increase in the tourism industry, the hotel sector also developed in order to accommodate the demand created by tourists, thus contributing to a significant impact on the environment in areas such as land conservation, degradation of scenic areas, water pollution and dirty beaches. These situations are more likely contributing to the increase of environmental problems in the hotel sector, as mentioned by Rivera (2004) that the rapid growth of visitors and hotel investment

has led to significant environmental problems especially around the parks and beaches. The hotels are the highest contributor to the environmental problems in the tourism sector because to support the industry, according to Rada (1996), the hotel sector involves several activities, such as transportation for tourist tour from one destination to another or landscaping to enhance the scenery. Furthermore, Rivera (2002) argued that land development for hotel construction and operations were likely to be associated with the pollution of rivers and beaches.

The above argument can be visualised as an 'ecological footprint' (Wackernagel and Rees, 1996). As suggested by Birkin, Polesie and Lewis (2007), this ecological footprint analysis is one of the tools to manage the ecological resilience. The idea of 'earth sharing' which is based on the total amount of productive land on the planet divided by the total global population has been developed to address global consumption of natural resources. However, the concept of footprints is useful to highlight the imbalance and inequality between the social, economic and environment global system. It displays the pressure of human needs on nature, but it does not explain the consequences of the impacts on the environment. Generally, as mentioned by Wackennagel and Rees (1996), if the size of footprint reduced, environmental quality is improved and the level of environmental degradation is also reduced.

As reported by the Business Times (May, 2007), Malaysia is a favourite destination among tourists from Asia as well as the entire world (for further information, refer to the Malaysian map in Appendix VI). Based on a report in RNCOS (2007), it is expected that international tourists in Malaysia will increase by 7.2 percent by 2011 as compared to 2006. The New Strait Times on May 19, 2007 which was reported in

PRZOOM ([www.przoom.com/news](http://www.przoom.com/news)) mentioned that up to May 10, 2007, tourist arrivals in Malaysia has already reached 8.9 million. Based on data in the Ministry of Tourism Malaysia's website as at August 2007, there was an increase in tourist arrivals and receipts (in MYR) for every year. Table 2.2 shows tourist arrivals and receipts (in MYR) in Malaysia up to March 2007<sup>10</sup>.

**Table 2.2:**  
**The Tourist Arrivals and Receipts**

Year	Arrival	Receipts (MYR)
2002	13.29 million	25,781.1 million
2003	10.58 million	21,291.1 million
2004	15.70 million	29,651.4 million
2005	16.43 million	31,954.1 million
2006	17.55 million	36,271.7 million
Up to March 2007	4,807, 604	Not Applicable

Source: Ministry of Tourism Malaysia (at [www.motour.gov.my](http://www.motour.gov.my)) as at August 2007.

In order to meet the rapid demand of the tourism industry, hotel development is a major trading component. Kasim and Scarlat (2007) stated that the main sector in Malaysian tourism industry is the hotel accommodation sector which has a crucial role in supporting the Malaysian tourism industry. However, unplanned and uncontrolled rapid hotel development has resulted in serious environmental degradation such as urban congestion from increased land use and new sites. For example, Wayakone et al. (1998) reported that most of the residents' and tourists' complaints in Langkawi island Malaysia were related to dirty beaches, no proper sewage treatment system in most of the chalets and hotels building and also improper

<sup>10</sup> The researcher has made an effort to contact key informants in the Ministry of Tourism Malaysia in order to get the recent data for tourist arrivals, at least up to August 2007; unfortunately, none of them were able to give the required information. Therefore, the data given in Table 2.2 are based on what was shown on MOTOUR's website as at August 2007.

monitoring logging. According to CUC (1998), the impact of hotel development is, in general, similar to that of all other structural facilities associated with the tourism industry, such as gaseous emissions from boiler stacks could pose air pollution problems, while the food waste, solid waste and other organic waste may result in odour problems.

Based on Radha's report (2004), major threats to the Malaysian hotel sector could be caused by the oil spills, waste disposal and open-burning. Radha (2004) claimed that Malaysia is one of the few countries in the world that had its own laws (such as the Malaysian environmental quality regulation, 1974) for controlling the environment long before the term 'environmentally friendly tourism' became widespread. As the international market becomes increasingly aware of the environmental friendliness of Malaysia, this will possibly encourage further tourism growth. However, currently, the environmental problems faced by the hotel sector appear to be increasing and changing. For example, Kasim and Scarlat (2007) report in their recent study that several key impacts in the Malaysian hotel sector, nowadays, are centred on the issues of energy consumption, water consumption, waste production and waste water management.

In Malaysia, there are no standards that particularly focus on the tourism industry or the hotel sector, in particular. The laws and regulations which were applied to other industries such as the manufacturing and construction industries are also applicable to the tourism industry. A considerable amount of investment has been made by the Malaysian Government and also by the individual hotels themselves to promote Malaysia as a world destination by presenting very clean and environmental-friendly hotels to tourist from all over the world. Radha (2004) mentioned that pertaining to the environmental management, the Federal and State agencies are responsible for the enforcement of legislation related to the environment. Where regulatory enforcements are lacking, corporate policy and environmental management systems (such as ISO 14001) will encourage hotel management to plan and implement appropriate environmental management practices (Kasim, 2004). The Malaysian Hotel Association (MAH) is also one of the NGO associations which is related to the hotel sector in general and does not focus particularly on environmental matters.

Hamid and Ahmad (2006) in their study which is not in the environmental management area, but in a similar idea regarding the new practice (i.e. knowledge management practice in tourism industry), mentioned that the Malaysian tourism industry has several challenges in implementing a new strategy. Among the challenges are:

- Lack of commitment from the top level management
- Poor coordination between government department, tourism Malaysia industry, Ministry of Tourism and other industry players

- Lack of skills to implement policies
- Poor links between research and the tourism sector

Therefore, this study is examining current environmental management practice in the hotel sector as an important part of the tourism industry and investigating whether, regardless of the environmental management practice the hotel sector has, the integration of management control systems and environmental management influence the hotels' environmental performance.

### **2.2.2 The Environmental Regulation in Malaysia**

The Malaysian environmental legislation was conducted to ensure that the firms in Malaysia follow the act and legislation to manage their environmental problems. The law and legislation related to the environment can be divided into two aspects, first, general law and legislation and second, the environmental legislation related accounting.

The general law and legislation<sup>11</sup> can be classified as Federal legislation and also State legislation. These laws and legislation are used by the government to enforce and encourage the Malaysian industry to voluntarily practise environmental management activities. This statement means that although legislation exists, it is not strictly enforced, so there is a situation of encouragement rather than coercion. These regulatory requirements are also applied to the hotel sector in Malaysia. The Federal legislation can be summarised as:

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<sup>11</sup> All the law and regulation can be access in the website [www.doe.gov.my](http://www.doe.gov.my)

1) The Environmental Quality Act, 1974 (Revision 1985)

As mentioned before, the Environmental Quality Act 1974 is the key piece of legislation covering environmental protection in Malaysia and contains clear provisions and empowers agencies to control and reduce environmental impacts from air and noise pollution, land contamination, pollution of inland waters and discharge of waste into Malaysian waters.

2) The Protection of Wildlife Act, 1972 (Revision 1976)

This act contains provision for the creation of sanctuaries and reserves areas for wildlife.

3) Pesticides Act, 1974

The act provides for the control of the import, production, sale and use of pesticides in Malaysia.

Whereas, the state legislation pertaining to tourism and hotel environmental problems is as follows:

1) Water enactment, 1920

The enactment provides for the control over the use of river waters. It is administered by the Land Office with technical assistance from the Drainage and Irrigation Department.



2) Land Conservation, 1960

This act is administered by the District Land Office and provides for the conservation of hill land and prevention of soil erosion.

3) Local government act, 1976

This act empowers the local authority to undertake necessary and practical steps in the management of refuse, prevention and control of the pollution of rivers and streams within its area.

The accounting regulations regarding environmental issues which are stated in ACCA's (2005) report are:

1) Occupational Safety and Health Act, 1994 and associated regulations

The Occupational Safety and Health Act, 1994 is an act which provides the general duties of employers, self-employed persons, manufacturers, suppliers and employees to ensure the safety, health and welfare of employees at work.

2) Companies Act, 1965

The Companies Act, 1965 is the principal legislation governing the conduct of companies in Malaysia, including the formation of companies, issuance of shares, debentures and charges, management and administration, company secretary, liquidation and wind up etc.

3) Listing requirements of Bursa Malaysia (formerly known as Kuala Lumpur Stock Exchange) 2001

The listing requirement for the main and second board listed companies of the Bursa Malaysia is aimed to enhance corporate governance, transparency and efficiency in capital market activities, in addition to strengthening investor confidence and protection of minority shareholders.

4) Malaysian Accounting Standard Board (MASB) standard

The MASB standard consists of 27 standards documents that set out the requirements for Malaysian accounting practices covering among other things, requirements for presentation of financial statements, impairment of assets, related party disclosure, segment reporting and interim financial reporting. For example, the Malaysian Accounting Standard Board (MASB) also has incorporated standards that encourage firms to disclose environment-related information in their financial reporting. Paragraph 10 of Financial Reporting Standard (FRS) 101 (formerly known as MASB 1): *Presentation of financial statements* and paragraph 20 of FRS 137 (formerly known as MASB 20): *Provisions, Contingent Liability and Contingent Assets* have clearly mentioned and recognised environment-related information.

5) Malaysian Code on Corporate Governance, 2001

Apart from regulatory and accounting standards, the Malaysian code on corporate governance represents a voluntary code of best practice to provide guidance to companies.

It is believed that the effectiveness of the local authority and national government in monitoring the environmental impacts of not only tourism, but other industries as well and the enforcement of this legislation are crucial in protecting the natural beauty of the country from being destroyed. Since the tourism industry involves several activities such as transportation, water usage, land use for building the hotel and accommodation and even though, there is no special regulation for the hotel sectors to manage those environmental impacts and problems, with the existing regulation introduced by the government of Malaysia, the hotels sector are more likely to have a guidelines in monitoring and controlling the environmental impacts caused by their activities.

### **2.3 State-of-The-Art of Environmental Reporting in Malaysian Firm**

ACCA (2003) in its Environmental Reporting Guidelines for Malaysian Companies has defined environmental reporting as

*‘the disclosure by an entity of environmentally related data, verified (audited) or not, regarding environmental risks, environmental impacts, policies, strategies, target, costs, liabilities, or environmental performance, to those who have an interest in such information, as an aid to enabling their relationship with the reporting entity via either, the annual report and account package, a stand alone corporate environmental performance report, a site-centred environmental statement or some other medium (e.g. Staff newsletter, video, CD-ROM and website) (page 9).*

According to the ACCA (2003), there is no statutory requirement in Malaysia requiring public listed companies to disclose environmental information to the public except for the legislation mentioned in section 2.2.2 above. Based on the report summary of the ACCA (2005)<sup>12</sup>, the number of companies reporting on environmental performance has increased from 25 companies in 1999 to 43 in 2002 and reached 60 companies by 2003. Up to 2004, the manufacturing sector is the largest sector to engage in environmental reporting, followed by the plantation sector and then, the trading and service sectors.

The ACCA's report (2005) claimed that the level of awareness among the firms in Malaysia to report their environmental practice is at an early stage. Thus, the companies need further explanation and motivation by the government such as granting them incentives and providing appropriate skills and environmental training programs. However, up to now, there has been no published study examining the level of awareness of environmental management practice specifically in the hotels sector in Malaysia.

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<sup>12</sup> The latest report update by ACCA only provides data up to 2003.

## **2.4 Chapter Summary**

This chapter provides a brief explanation regarding environmental issues in Malaysia and in the hotel sector in particular. The regulations and legislation with regard to environmental issues were briefly discussed along with the aspect of environmental reporting and its legislation.

The issues pertaining to environmental activities in the hotel sector and environmental performance are discussed in the next chapter.

## Literature Review

### 3.1 Introduction

Environmental degradation such as toxic waste, global warming, acid rain, ozone layer depletion and the clear-cutting of forest have become global concern, especially for political teams as a result of human activities. Bansal and Howard (1997) and Hoffman, (2000) report that recently, the debate on the global climate change and contracting global biodiversity are becoming more common in the corporate world especially with concerns over water, air and soil pollution. According to Baba (2004), public concern and opinion should be listed as the top priority of any political agenda in order for the debate to contribute directly to the new legislation mandated to reduce environmental problems.

Since the Rio Summit Conference in 1992 until today, numerous meetings have been held (such as Johannesburg Conference in 2002 which discuss the evolution of international environmental law) but environmental problems remain unsolved. Previous studies examine the relationship between the practice of environmental management activities and environmental performance (such as Carmona-Moreno et al., 2004; Wagner and Schaltegger, 2004; Baba, 2004; Wagner, 2002; Gil et al., 2001; Theyel, 2000) and firm performance (such as Russo and Fout, 1997; Klassen and McLaughlin, 1996) but, they do not take into account the view that the influence of the extensive use of a management control system on either financial or environmental performance.

It is still not clear to what extent the role of management control system plays within that relationship. For examples, does the management control system have a significant moderating effect<sup>13</sup> on the relationship between environmental management practices and environmental performance or does it mediate<sup>14</sup> the relationship?

Thus, this current study argues that the management control system can be used and integrated with environmental management practices which will hopefully lead to better environmental performance, and in turn better financial performance. In other words, the management control system is visualised in the context of environmental management. As suggested by Schaltegger et al. (2003), integration means the application of a management control system in the context of environmental management.

This study will also examine on how the integration influences the relationship between environmental management practices and environmental performance and what extent the role of environmental management control system plays within that relationship. Hence, the related concepts of the environmental management, the management control system and the environmental performance are discussed. A brief review of some of the theoretical and research contributions in this field will now be given.

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<sup>13</sup> The moderating effect means that a moderator variable(s) affect the relationship between an independent variable(s) and dependent variable(s) but does (do) not have a bivariate relationship with either the dependent or independent variable(s) (Shields et al., 2000, p185).

<sup>14</sup> Mediating is caused by an independent variable(s) and causes a dependent variable(s) (Shields et al., 2000, p185)

### 3.2 Environmental Management

In general, environmental management is an activity which aims to protect the environment. In order to properly implement environmental management to protect the environment, Winn and Angell (2000) suggest two dimensions of environmental management to be practised, i.e. the degree to which environmental management practices are used and the level of management commitment. Burgos-Jimenez et al. (2002) also stated in their study, environmental management is a tool which firms use to reduce or control the impact of its activities on the environment where Schaltegger et al. (2003) mentioned that the specific and correct management tools should be involved for environmental management to be effective.

In other words, the current study defines environmental management as a tool to manage all the physical aspect of the environment such as land, water, air (including noise and smell) and others which appear in human surroundings in order to ensure that the environment is not being degraded and stays clean.

In order to understand the environmental management framework, there are many concepts which are related to environmental management which should be discussed. The body of literature reviewed in this area include environmental management practice, environmental management strategy, environmental management system and environmental standard and policy, such as ISO 14001 and sustainable development.



### 3.2.1 Environmental Management Practice

In the environmental management literature, there is an argument that it is not possible to standardise practices of environmental management because the term 'environmental management' has different meanings to different people. Carmona-Moreno et al. (2004) stated that environmental management involves a variety of environmental practices which differ depending on the industry, the nature of business and its impact on the environment. In addition, Carmona-Moreno et al. (2004) mentioned that the characteristics of the industry with regards to environmental issues will affect the nature of environmental management practice in firms. In their study, the characteristics of the hotel sector with regards to environmental issues such as spreading of environmental impact, limited environmental legislation and active customers contribute to how the hotel sector responds to their environmental problems. For example, having limited environmental legislation, hotels react to environmental problems by practicing environmental management voluntarily and more emphasis on pollution prevention activities.

Berry and Rondinelli (1998) however, suggested that in order to improve performance, each firm should practice appropriate environmental activities and strategies (for example, proactive strategy). Furthermore, Winn and Angell (2000) agreed that proper implementation of the different environmental practice should result in improvement of the firm's environmental performance.

Schaltegger et al. (2003) argued that good environmental management practice should have six key functions; goal setting, information management, decision support,

control, communication and auditing and review. In order to support all these functions, the environmental management tools that should be considered for implementation include total quality environmental management, life cycle assessment, environmental accounting, environmental reporting and environmental auditing.

Furthermore, several researchers such as Florida (1996), Garrod and Chadwick (1996), Griffin (1995) and Heffelman (1995) have identified significant adoption of environmental management elements among the firms studied. These studies reveal broad trends of adoption of environmental practices across industrial sectors and firm size. But, according to Theyel (2000), none of these studies focused on the entire industrial sector as all included fewer than ten firms from any one of a number of industrial sectors. Therefore, these researchers were prevented from drawing statistically significant conclusions and forming generalised conclusion about the adoption of environmental management in particular industries.

Environmental management practice, usually, represents the environmental management strategy of a firm. According to Klassen and Whybark (1999), by using environmental management practices, a firm can determine its environmental strategy. It is also argued by Azzone and Noci (1998) that firm strategy can be determined by internal and external factors related to environmental issues which were translated by its practice.

Normally, firms practising environmental management followed environmental management system (EMS)<sup>15</sup> principles; i.e. plan, organize, command, coordinate and control. According to Boiral and Sala (1998), successful management needs to follow a system that involved such environmental management system principles.

Therefore, the study argues that any practises related to the environment should follow the environmental management system principles such as creating an environmental policy, setting objective, implementing a programme to achieve those objectives, monitoring and measuring its effectiveness, correcting problems and reviewing the system to improve it and thereby environmental performance.

### **3.2.2 Environmental Management Strategy**

In general, Simons (1995) defined strategy as a plan, pattern of actions, product market position or a unique perspective. In environmental management perspective, strategy is defined based on basic corporate environmental strategies<sup>16</sup>. According to Schaltegger et al. (2003), basic strategies related to the environment can be classified using five factors; level of income, time element and implementation, level of coordination and location of element. Most of the environmental management literature defines environmental management strategy depending upon how firms interpret environmental management practice. Normally, environmental management strategy ranges from proactive to reactive.

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<sup>15</sup> The environmental management system is discussed in depth in subsection 3.2.3.

<sup>16</sup> Basic environmental strategies is a strategy that reflect how business responds to environmental problems (Schaltegger et al., 2003)

In management accounting literature, strategy can be operationalised in many different ways. For example, Jansson et al. (2000) and Langfield-Smith (1997) classified strategy into two types; corporate strategy and business strategy. Corporate strategy is concerned with the types of business being operated and involves group level where it concerns the decision making process, investment, resources acquirement and specifically focuses on strategic level. While business strategy relates to each business unit of the firm and focuses on how the unit can achieve competitive advantage.

Several types of environmental management strategies have been grouped by several researchers. For example, in seminal work with regards to strategy, Miles and Snow (1978) grouped strategy into three; defender, prospector and analyser, while Porter (1980, 1985) has grouped environmental strategy into cost leadership, differentiation and focus. Both of the literatures have been cited in many articles in environmental management literature. However, some researchers, such as Brown (1996), Theyel (1999), Jansson et al. (2000), Benito and Benito (2004) and Carmona-Moreno et al. (2004) classified environmental management strategy into different types of strategy, for example, reactive-proactive type strategy.

Environmental management strategy is mainly influenced by the management level at which the environmental management practice has been established. Based on Anthony and Govindarajan (2001), there are three levels of management; strategic level, tactical level and operational level. Environmental management strategy is basically based on the basic environmental strategy and most of the environmental

practices are placed at tactical level, where end product of this level is implementation of strategy. Anthony and Govindarajan (2001) mentioned that the management control system is also an activity at tactical level where both planning and control are equally important (See Table 3.1). Therefore, implementations of strategy and management control systems are placed at the same level of management practice.

However, the current study believes that both tactical and operational levels are equally important to improve environmental performance. Therefore, the current study uses both levels to operationalise environmental management practice and strategy. According to Rondinelli and Vastag (1995), most research had focused only on one of the three levels in which environmental management practices relate to decision making.

**Table 3.1:**  
**Activity, Level of Strategy and End Product**

<b>Activity</b>	<b>Level</b>	<b>End product</b>
Strategy formulation	Strategic level	Goal, policy
Management control	Tactical level	Implementation of strategy
Task control	Operational level	Efficient and effective performance of individual task

*Source: Anthony and Govindarajan (2001; 6)*

According to Schaltegger et al. (2003), environmental management strategy is reflected in how businesses deal with environmental problems. Kim (2003) mentioned that environmental management strategy is no longer optional for the corporate decision making process. In other words, environmental issues must be seen as vital issues for business decisions and therefore, should be on top of any agenda that has been made. The more the businesses commit to environmental

management practice, the more proactive the businesses are. Henriques and Sadorsky (1999) also mentioned that what a firm is actually doing or has done with reference to environmental issues can be described as its 'commitment to the natural environment'.

To summarise, the current study proposes that environmental strategy may be defined according to a firm's commitment to environmental management practices at management (tactical) level and operational level.

### **3.2.3 Environmental Management System and ISO 14001**

According to Todd (1994) and Puri (1996), the environmental management system can be described as a management approach, complement to government rules, part of the broader management systems of an organization, and formally structured and detailed. An environmental management system aims to ensure compliance with the law and the continuous improvement of environmental (and not necessary financial) performance (Bell and Lehman, 1999).

A similar argument has been discussed in the definition given by several authors such as Pawar and Risetto (2001) and Andrew et al. (2003). Both of them defined the environmental management system in terms of a management perspective which concentrates on how firms monitor their environmental activities to enhance their effectiveness, using detailed procedures and policies. By focusing on managerial perspective, firms more likely interested to enhance their management responsibility to control and monitor their environmental impacts prior to developing any activities.

Pawar and Risetto (2001) define the environmental management system as management activities (processes and procedures) that permit firms to analyse, monitor and decrease the effect of environmental activities on their operations and services to gain better performance, such as increasing cost saving, increased efficiency and compliance with regulations. Also, Andrew et al. (2003) define the environmental management system as a set of formal rules and procedures that lead firms to manage their potential environmental impact on their surroundings.

In sum, an environmental management system is actually focused on the environmental management practices of individual firms. The basis of an environmental management system is the regulation and procedures which define how environmental management systems are implemented in a firm. According to Yarnell (1999), the conceptual framework of an environmental management system is often concluded by managers and consultants as *'say what you do, do what you say. Prove it'*. This framework suggests that there is a continuous process that requires management,

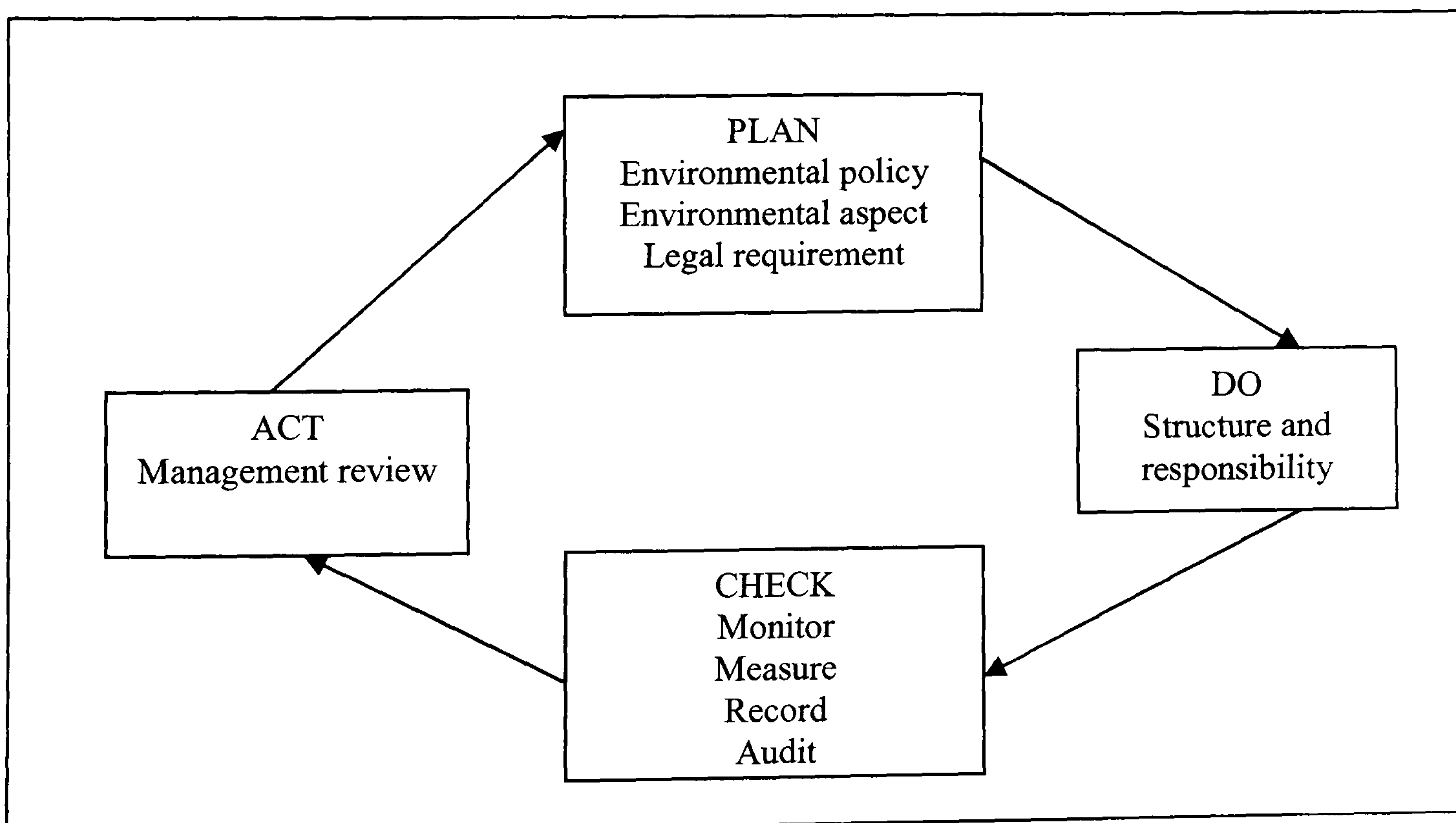
- To make an effort to achieve higher standards of environmental performance and,
- To follow the systems that implement all the management functions, such as planning, organizing, monitoring and reviewing.

The current study argues that the framework of environmental management systems which mentioned above have similar function to management control system and therefore, the integration of management control system in environmental management is believed can be applied to enhance environmental performance.

A popular and better-known model of management system is called the Plan-Do-Check-Act Cycle (see Figure 3.1). It was developed by Dr Walter Shewhart in the 1930s. This model is sometimes referred to as the Demming Cycle (Begley, 1996; Welford, 1996).

**Figure 3.1:**

**The Plan-Do-Check-Act Cycle of an Environmental Management System**



*Source: Begley (1996)*



Schylander (2004) stated that environmental management practices should be organized according to policy and the people who are responsible for implementing the policy should be specified, then objectives and targets will be achieved. Therefore, either firms, in general, or hotels, in particular, implement the policy and procedures to guide the operation, such as ISO 14001 and EMAS to link the environmental decisions to the expected end results. The type of control system related to policy and regulation is called as a boundary system by Simons' (1995) framework or an action control by Merchant's (1997) framework.

Then, describing the roles and responsibilities of day-to-day tasks related to environmental aspect should be documented as an internal structure of a firm. Schylander (2004) suggests that this step should involve the communication procedures (internal and external) for receiving, documenting and responding to relevant information (e.g. environmental information). This step also includes operational control and response to activities that are in line with the objectives and targets (Schylander, 2004). The responsible department, such as environmental department is related to the level of training and environmental awareness program (Marquest-Pondeville, 2000) and thus, relates to personnel and cultural control systems, either in firms or in hotels particularly.

The third cycle is to investigate, monitors and measures the operations and activities that can have a significant impact on the environment. This step is vital and needs an effective management control system in order to ensure that everything goes as planned, either in firms in general, or in hotels, in particular. The performance

measurement, such as using budgeting control system and bonus incentives on environmental performance help to translate the plan into everyday actions (Hunt and Auster, 1990). This step involves the result controls (Merchant, 1997) or diagnostic control systems (Simons, 1995).

Finally, the last step in the cycle is to review the system in order to meet the requirement of continuous improvement. The procedures will be corrected and corrective action will take place. This step needs the personal involvement of top management in order to ensure the objectives are accomplished. Face to face meeting and the implication of the decision making are essential to take into account in this process. In Schylander (2004), continuous improvement is defined by ISO<sup>17</sup> 14001 as a process of enhancing the environmental management system to achieve improvement in the whole process of environmental performance.

The ISO 14001 is a standard that describe the basic elements of an effective environmental management system and is being implemented by many organisations, including hotel sector, throughout the world (NADCA, 2004). The ISO 14001 refers to the concept of continuous improvement with five core elements; environmental policy, planning, implementation and operation, checking and correcting and management review (CSA, 1996). An effective environmental management system can help firms to managing, measuring and improving the environmental aspects of its operations.

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<sup>17</sup> ISO is an International Organisation for Standardization

In other words, ISO 14001 and any environmental management system can determine the required system and procedures for conducting day-to-day operations by focussing on the effect of a firm's activities on the environment. The result of this requirements-driven environmental management system will be to reduce the environmental impacts of business activities, and to ensure that management systems function efficiently and effectively manage the applicable requirements. The ISO 14001 standard which was published in September 1996 provides the basic framework of a formal environmental management system.

NADCA (2004) lists the elements that are included in the ISO 14001 standard which are policy, organisational structure and responsibilities, standard operating procedures, control for critical operations, document control, training, recordkeeping systems, internal audits, corrective action systems and management review. Lally (1998) highlighted the requirements of ISO 14001 that is formation of an environmental policy and commitment to an environmental management system, development of a plan of implementation, operation of the environmental management system, monitoring and taking possible corrective action, top management review and continuous improvement.

Many experts in different areas, such as Green and LaFontaine (1996) and Miller (1998), contributed to the development of ISO 14001 and different areas continuously influence its development and use. Among the factors that contribute to development of an environmental management system are health and safety, environmental auditing, internal control and total quality management. ISO 14001 provides a

framework to help firms that are environmentally aware to integrate environmental management systems into their business operations. With improved environmental performance level, society can start to reduce the level of environmental damage that it causes.

However, there is an argument within the ISO 14001 system regarding the use of ISO 14001 as a tool to improve environmental performance. Krut and Gleckman (1998) state that ISO 14001 is not a tool that will improve environmental impact, but only an internal tool to manage environmental aspects of an organization's operations in order to improve environmental performance. Also, Kim (2003) mentioned that many firms apply ISO 14001 as a simple certification process without knowing the benefit they will obtain. In other words, ISO 14001 is only a requirement which should be met by any firm who are intend to integrate environmental matters into their daily operation and cannot be used alone to enhance environmental performance.

Schaltegger and Sturm (1990) in Schaltegger et al. (2003) defined environmental impact as,

*'the influence of a corporation's activities on the physical environment (e.g. the impact on land, water and air quality and on biodiversity). The emphasis is on processes and activities' (p31).*

Schaltegger et al. (2003) highlighted that there is no value added without environmental impact added. However, they argued that in order to achieve improved environmental performance, firms need to reduce environmental impact added. Schaltegger and Sturm (1990) in Schaltegger et al (2003) defined environmental impact added as,

*'the sum of all environmental impacts that are caused directly or indirectly by business activities, significant because of the type and quantity of material and mass of energy used by businesses in their activities and assessed according to the relative environmental harm they cause' (p31)*

As in tourism industry, in general and hotel sector, in particular, the environmental impacts are caused by the way in which hotels consume their resources such as using land to build a new accommodation, water for laundry or for swimming pool or purchase an electrical appliances, toiletries and food. The negative or positive output from their input above, such as water waste, carbon dioxide emissions and sewage should be monitored properly to ensure the environmental impact added is reduced and their environmental performance is improved. As suggested by International Hotel Environment Initiatives (IHEI) (1996), the effect of hotel businesses on sustainability should be monitored by considering the hotel's operation input and output.

Apart from ISO 14001, EMAS (Eco-management and Audit scheme) was the first environmental management system standard (Schaltegger et al., 2003). EMAS was expanded to include companies in the service sector and it was issued by the

European Union (EU). The objective of EMAS is similar to ISO 14001 in which to assist firms to improve their environmental performance. The difference between them is from the perspective of implementation where EMAS is regulatory and ISO 14001 is voluntary (Schaltegger et al., 2003). According to Schaltegger et al. (2003), EMAS requires firms to publish an environmental statement, assess all the significant relevant environmental impact of their activities and summarise the cost of the pollutant emissions, waste generation, energy, water and other significant environmental impacts.

However, Schaltegger et al. (2003) argued that none of these standards specifies how the requirement should be met. According to them, the standards also do not provide any method for implementation of decision-making processes. Therefore, management in either firms in general, or hotels in particular, should practice the environmental management that is flexible enough to be adapted to new development, such as environmental management control system.

#### **3.2.4 Sustainable Development**

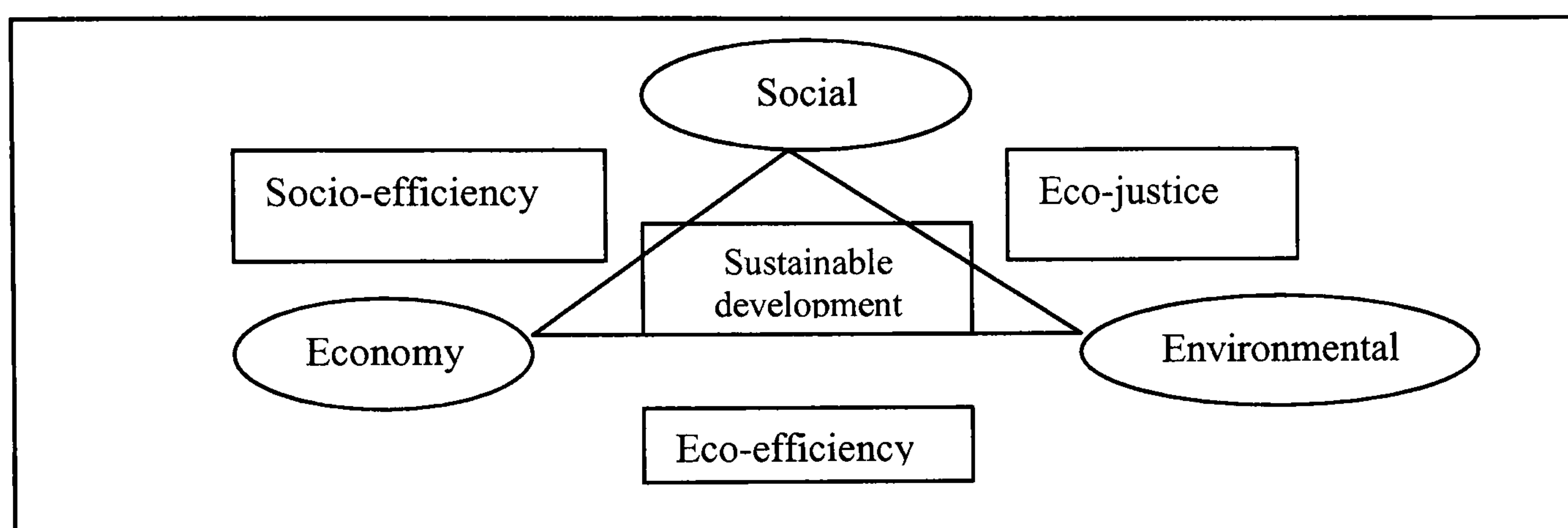
The basic premise of the concept of sustainable development comes from the definition given by The Brundlant Report as stated in WCED<sup>18</sup> (1987) as to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is a concept that combines three important dimensions; social, economic and environment (Schaltegger et al., 2003) into an integrated single perspective. The integration of any two dimensions leads to the concept of eco-efficiency, eco-justice and socio-efficiency (see Figure 3.2).

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<sup>18</sup> WCED is World Commission Economic Development.

This concept is actually concerned not only with economic growth but also with environmental improvement. In other words, this concept tries to increase the level of the economy and at the same time, does not ignore the quality of life and human justice. It means that future generations should have an equal opportunity with current generations to exploit natural resources.

**Figure 3.2:**  
**The Three Main Goals of Sustainable Development**



*Source: Schaltegger et al. (2003; 21)*

Similarly, Wagner (2002) visualised sustainability development with three core concepts, i.e. environment, social and economic goals. The overlap of these three pillars is called sustainability where according to Schaltegger et al. (2003), sustainability is the goal of the process of sustainable development. Sustainable development is actually based on the balancing concept between economic growth and environmental protection.

In order to meet the requirements of sustainable development, the ISO 14001 framework can help people in firms gain effectiveness in implementing environmentally sustainable forms of management (Kim, 2003). However, the

current study argues that to meet sustainable development, the main core concept of environmental management should first be properly managed.

Beside that, it is important to note that the notion of sustainable development has been established in firms in order to redefine their corporate social and environmental responsibilities (Hart, 1995; Stanwick and Stanwick, 1998). According to the traditional perspective, Friedman (1970), Jensen and Meckling (1976) and Carr (1989) argued against the corporate social responsibility where they claimed that there is no room for the irrationality in firms and the only responsibility of the firm is to make a profit and to protect the interest of its shareholders. However, according to Wheelen and Hunger (1998), the concept of social responsibility proposes that a private firm has responsibilities to society beyond making a profit. To achieve the sustainable development, firms should fulfil the moral, ethical and legal obligation to society (Goodwin, 1996).

In tourism industry, concept of sustainable tourism is derived from the general concept of sustainable development. Welford et al. (1999) stated that World Tourism Organisation's defined the sustainable tourism as:

*Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems (p 166).*



The confusion of the definition above causes the problems on translating them into effective practical measures (Hobson and Essex, 2001) and sometimes has conflict in implement strategies in integrating tourism products into the economy, environment and the local community. For instance, in order to develop the tourism industry, the industry will require new land to be developed and natural resources to be consumed as at the same time it contributes to economy it causes the environmental problems. Cater (1995) put forward the argument that the sustainable outcome would involve trade-offs between local land among environmentalist and developmentalist. For example, restricted tourism development has been allowed on forest reserve at Teluk Datai, Malaysia where an exclusive resort has been built in the area whilst the local population were denied access to the headland (Radha, 2004).

Having acknowledged this challenge, the current study argues that integrating management control system in environmental management initiatives lead to sustain the tourism development and in particular, hotel sector in the long term. For example, by putting environmental cost in budgeting control system can assist hotel management to plan ahead and move the hotel activities and operations according to the budget, thus the environmental performance will improve.

### 3.3 Management Control System

Management control is an integral part of management responsibilities (Fowler, 2001). The system provides information to managers in order to assist them in making decisions according to their plans and objectives. There are several definitions given by previous authors such as Anthony (1965), Simons (1987, 1990 and 1995) and Anthony and Govindarajan (2001) and all the definitions are discussed below.

#### 3.3.1 Definition

‘Control’ is a very ambiguous term and has a different meaning in different contexts and is very difficult to define precisely (Schaltegger et al, 2003). Prior research such as Anthony (1965) has found systematic differences between control at the corporate level, management level and operational levels. However, according to Simons (1987, 1990), the control system is vital for both the structure of the firm and for the process of strategy implementation.

Even though, in Anthony and Govindarajan (2001) visualised management control system as an activity between strategy formulation and operational level which both planning and control are equally important (refer to Table 3.1, subsection 3.2.2), the current study argues that rather than considering management control systems at all levels or only one level, the system should involve both the management (tactical) level and the operational level. This argument is founded on the basis that to move a firm towards its strategic objectives, a firm should implement its strategy efficiently with assistance from its staff and employees who perform their tasks effectively.

At the management (tactical) level, an effective control system will increase the capabilities of top management to motivate and monitor their employees in order to achieve their aims and objectives by implementing the strategy. While, at the operational level, employees will perform their tasks more efficiently and effectively in order to help managers to meet their objectives.

The contingency-based theory assumes that different strategies or practices need different designs of management control system to fit the specific circumstances of the firm for which it is intended (Fowler, 2001). As Langfield-Smith (1997) suggests different designs will require different ways to implement them. Therefore, there is no one control system and no one type of information system that is suitable for all firms in all circumstances.

Most of the previous works concerning management control systems from the management-oriented view have cited Anthony's (1965) definition where he looked at the system process input and output. Anthony's (1965) classic definition of management control was

*'the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the firm's objectives'. (p 17)*

However, Anthony's definition could be questionable and outdated. His definition is too restrictive concerning the procedure meeting the objectives. According to Otley et al. (1995), Anthony's definition had visualised the method used to control the

process as being highly dependent on specific technology, while he ignores the behavioural issues. Otley (1994) mentioned that several changes have happened to the structure of firms, such as an increase in service-based firms and that the environment surrounding a firm is less predictable, which leads to difficulty in implementing management control systems. Therefore, as Broadbent et al. (1995) stated that as well as firms utilising different strategies to handle changes in firms, the management control system process must also change to facilitate these firm changes. For example, if a firm utilises and adapts strategy related to environmental issues, the firm should allow the management control system to adapt to the changes in that strategy. In other words, the management control system used should integrate environmental matters into the system, and then a firm's objective will be met.

On the other hand, following Lowe's (1971) definition, the management control system is a system that is concerned with the process within each individual level of environment. In other words, the management control system is concerned with both strategy at the management (tactical) level and operational issues at the operation level. Tactical issues refer to how firms react to the surrounding environment, monitor it and follow-up the implementation of a given strategy, while operational issues refer to the application of plans to achieve overall objectives.

Flamholtz et al. (1985), in contrast, defines the management control system as a behavioural process. They assume that individuals and groups in the firm will behave in ways that lead to the achievement of objectives and may be achieved by four core control mechanisms which are planning, measurement, feedback and validation reward. In other words, the management control objective is to influence the people

in firms (such as employees) in order for them to act more efficiently to achieve the objectives of the firm.

Simons's (1987, 1990 and 1995) definitions seem in line with Flamholtz et al.'s (1985) definition. Simons's definition focuses on procedures and systems that are more formal. His definition concentrates on the formal procedures which will maintain and change the firms' activities patterns where the changes will influence how individuals and groups in the firm behave towards their objectives. Simons (1995) defined the management control system as '*the formal, information-based routines and procedures managers use to maintain or alter patterns in organisational activities*' (p 5). Simons (1995) introduced four key variables that must be used for controlling business strategy. The four key variables were belief systems, boundary systems, diagnostic control systems and interactive control systems. Simons (1997; p11) argued that any theory of management control must be examined on three perspectives:

1. the extent to which potentially important variables are included in the theory,
2. the clarity of the linkage between control system variables and the achievement of organisational strategies, and
3. the reliability and validity of the evidence

Table 3.2 summarise the characteristics of four levers of Simons' (1995) control systems.

**Table 3.2:**  
**Four Levers of Simons' (1995) Control Systems**

Lever of control systems	Objective	Characteristics
Belief systems	Framing a strategic domain	<ul style="list-style-type: none"> <li>• Top management communicate through document, vision and mission statement</li> <li>• To inspire and guide of searching and discovery for new opportunities</li> <li>• e.g. cultural controls</li> </ul>
Boundary systems		<ul style="list-style-type: none"> <li>• Give a guidelines to limit the action</li> <li>• Based on business risk and opportunity seeking</li> <li>• e.g. procedure, policy</li> </ul>
Diagnostic control systems	Implementing intended strategies	<ul style="list-style-type: none"> <li>• Ability to monitor output</li> <li>• Performance measurement where comparing standards and actual result</li> <li>• Ability to correct deviation from the standards</li> <li>• e.g.: use budgeting as a control system</li> </ul>
Interactive control systems	Adapting to competitive environment	<ul style="list-style-type: none"> <li>• stimulate search and learning, allowing new strategies to emerge</li> <li>• managers involve themselves regularly and personally in the decision activities of subordinates</li> <li>• e.g. top management and personnel involvement</li> </ul>

*Source: Simons (1995; p 12)*

In a more comprehensive definition, Anthony and Govindarajan (2001) define the management control system as *'a process that managers can influence other members of the firm in implementing firms' strategy'* (p 6). They relate the management control system to strategies carried out within the firm and consider the impact of human behaviour on whether the system works in firms and whether the management control system helps managers move a firm toward its strategic objectives.

Therefore, the current study uses the definition which is inspired by the Flamholtz et al.'s (1985) definition, Simons' (1987, 1990, 1995) definition and Anthony and Govindarajan's (2001) definition. The environmental management control system in the hotel sector used in the current study is defined as *any process or action taken by hotel managers to influence the possibility people in hotels behave in ways to achieve environmental objective and to allow the emergence of new ideas and opportunities to implement hotels' environmental strategy*. The elements included in the definition are vital because the environmental issue is a new stake for the firms in general and hotels in particular and therefore, it needs a new idea and managers must have the authority to influence people in their hotel to act towards achieving hotels' environmental objectives.

### **3.3.2 Eco-Control**

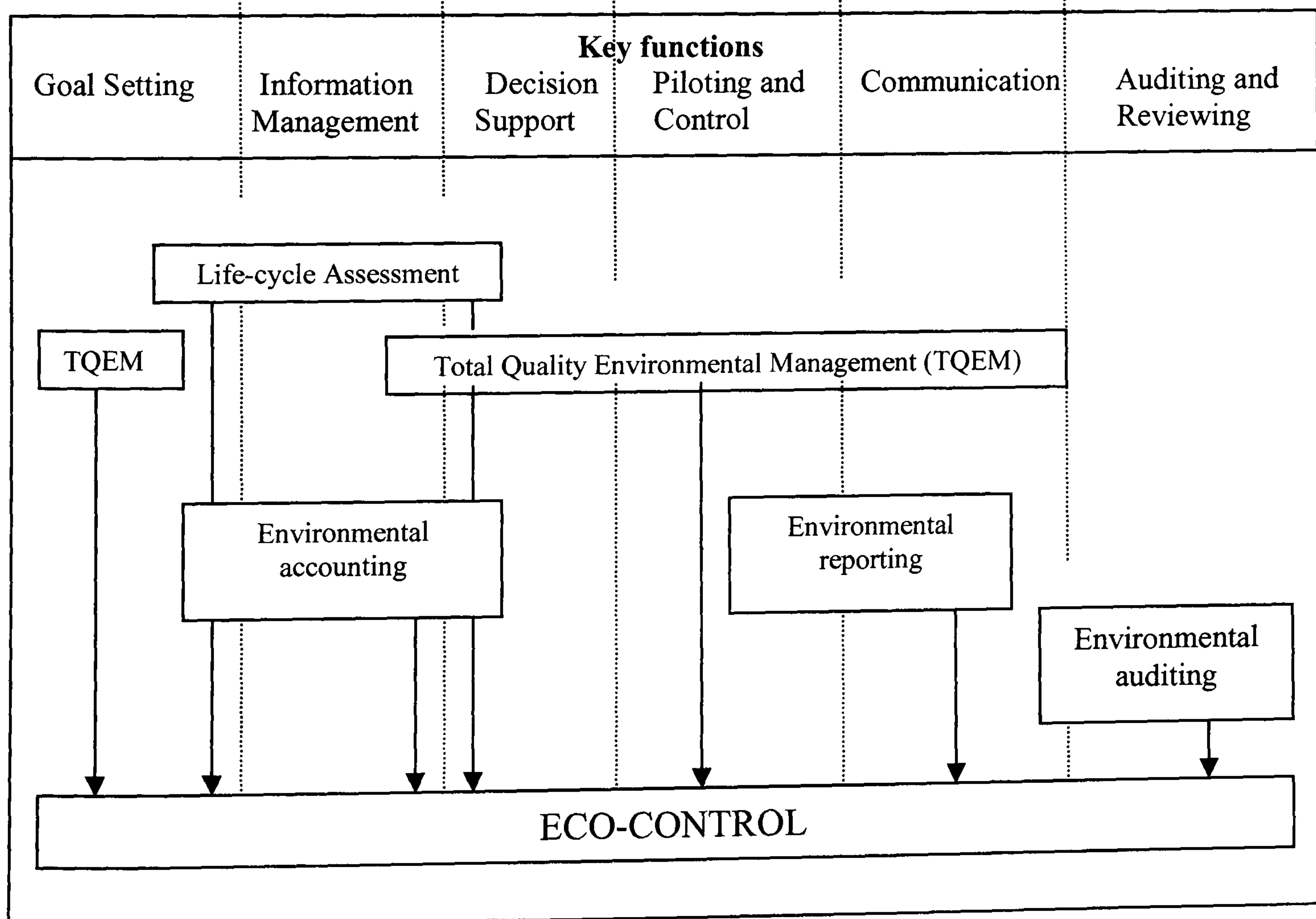
Eco-control is the application of the control system to environmental management (Schaltegger et al., 2003). According to Schaltegger et al. (2003), the concept of the eco-control system is designed with the purpose of integrating and coordinating environmental management tools into the management control system (refer to Figure 3.3).

Schaltegger et al. (2003) suggested that eco-control is about learning how people in the firm manage to control environmental issues as a whole. They mentioned that control is one of the basic functions of management and external regulation and it includes all the management functions such as planning, action, measurement, comparison between plans and actual outcomes, feedback and revision of

expectations for future periods. These are all components of a system approach to management and similar to the concept of environmental management system (EMS) where the EMS is referred to the concept of continuous improvement with five core elements; environmental policy, planning, implementation and operation, checking and correcting and management review (CSA, 1996). For example, by comparing the environmental cost planning on site development for hotel building to accommodate tourists and guests and the actual outcomes using budgeting control system, the feedback and correcting action can be done by the hotel management in order to ensure the environmental performance improves thus contribute to the sustainable tourism development.

Figure 3.3:

**Functions and Tools of Corporate Environmental Management**



Source: Schaltegger et al. (2003; 318)



Traditionally, control is the key function of corporate management and tends to be achieved through a set of management controls. The control process is generally based on accounting information. Eco-control ensures that environmental issues are dealt with through a continuous process. Schaltegger et al. (2003) mentioned that environmental accounting supports information management by collecting, compiling, analysing and making decisions based on environmentally-induced financial and environmental impact-added data. For example, in the hotel sector, the sewage and carbon dioxide emissions data can be collected by using proper environmental accounting. Furthermore, environmental auditing can ensure that the hotel's activities comply with rules and regulation and protect the activities from harm the environment.

Based on Schaltegger et al. (2003), the integration of environmental management tools such as total quality environmental management, environmental auditing, environmental accounting and reporting and life-cycle assessment to the management control system will enhance environmental performance.

Therefore, the current study follows the management control system framework in order to ensure that environmental management strategy is well implemented and thus, environmental performance will be increased. The package or combination of multiple management control system elements is used to improve environmental performance.

### 3.3.3 The Variables of Environmental Management Control System

A management control system, in general, is an important part of the structure of the organisation (Hill and Jones, 1992) and of the strategy implementation process (Olsen et al., 1992; Simons, 1990; Anthony and Govindarajan, 2001). The environmental management control system is applied when firms integrate the environmental issues into their management control system and use environmental management tools in its application.

The basic premise of this study is that the use of management control systems should be integrated into environmental management tools and promotes environmental management strategy in order to enhance environmental performance. Building on this premise, the environmental management control system should incorporate, not only one but a package of management control systems. As mentioned before, drawn from the management control system framework, the environmental management control system is a framework when the firms consider the environmental matters into the management control system elements. For example, firms include the environmental expenses, revenue and investment in budgeting process.

In summary, according to the management control literature and building from the Simons' (1995) levers of control, the specific control mechanisms that are widely used in practice and have been shown to have a theoretically linked to environmental practice or strategy and performance are interactive control systems (top management and personnel involvement), diagnostic control system (environmental budgeting system), belief control system (environmental cultural control) and information based

system (environmental information system). Since firms in Malaysia have shown their awareness on environmental problems (Baba, 2004), the current study considers that hotels in Malaysia also already have the boundary system (environmental policy and procedure such as EMAS, ISO 14001) to pursue their environmental strategy, therefore, this level of control system does not include in the investigation. The only interest is to clarify the role played by the other levers of control on the hotels' environmental performance since previous studies such as Simons (1995) are absent to clarify the issues.

### **3.3.3.1 Interactive Control System (INTERACTIVE)**

According to Simons (1995), the interactive management control system is a control system that managers use to involve themselves regularly and personally in the decision activities of subordinates. Based on Simons's previous study in 1990, top management will share their knowledge to motivate firms to learn and to create new ideas and new strategies. Hence, the use of new knowledge to assist managers to actively monitor and intervene in continuous decision activities of subordinates will make the management control system become interactive. Due to the fact that a management control system is a 'system', the information is typically fed back to managers of the various phases and then appropriate action is taken based on data or information provided to meet the objectives.

Top management commitment is likely to be involved in the environmental management of environmentally proactive firms. Anderson and Bateman (2000) mentioned that top management commitment will be more proactive in their environmental effort if their value systems reflect environmental concerns.

Dutton and Ashford (1993) suggested that a lack of support from top management posed a substantial barrier to environmental efforts and initiatives. In addition, Chandrashekar et al. (1999) stated that top management commitment is even more vital in environment protection than even for quality management.

Ahmed et al. (2003) in their study of sixty companies in the US, examine the link between environmental concern, environmental effort and their impact on firm performance. They found a positive correlation between environmental concern and effort, but no correlation was found in the relationship between environment effort and profit. The study also observed that top management commitment is a key element of environmental initiatives. As Quazi (1999) suggested, top management commitment is one of the critical success factors that are related to the implementation of ISO 14001.

Communicating and educating people in the firm regarding the importance of environmental issues is very challenging. Chinander (2001) suggested that it is difficult to have top management commitment in implementing an environmental strategy to facilitate environmental education. However, the theoretical and empirical Total Quality Management's literature recognises that top management commitment is very important to support better performance and high quality management practices (Crosby, 1979; Gibson, 1990; Gilbert, 1990; Puffer and McCarthy, 1996).

It is well documented in the environmental management literature that firms should involve all employees in the environmental awareness programmes, whereby management at the corporate level and top management at the business unit level should initiate these programmes and be the first motivators for the programmes. For example, based on Huang (2001), an educated and well-trained worker is considered to be essential in maintaining a firm's competitive advantage in a global economy.

According to Pendleton (1989), the concept of employee or personnel participation and co-operative management-worker relations leads to better quality in working life. Accordingly, Zutshi and Sohal (2003) stated that personnel are one of the key resources of any firm and this can have a significant impact on how the firm operates.

Baba (2004) has cited one study conducted by the Monash Centre for Environmental Management in collaboration with the Australian Industry Group in year 2000 where the study determined the relationship between environmental management practices, productivity initiatives and competitive strategies. This study involved both an interview and a questionnaire survey of Australian manufacturing organisations. The results showed that the increased contribution and involvement of employees in environmental management programmes has also resulted in more effective usage of raw materials and reductions in waste, thus leading to the reuse of materials and a decrease in pollutant releases. Similar findings were also given by Newman and Breeden (1992) and Merchant (1997) in the manufacturing context.

Newman and Breeden (1992) mentioned that training and skill development programmes are very important to ensure that employees gain skill to increase environmental awareness while Merchant (1997) said that personnel control permits firms to ensure that personnel can commit and direct their behaviour towards firms' objectives and thus, lead to improved performance. Theyel (2000) also found that involving employees in pollution prevention leads to improvement in environmental performance.

On the other hand, an incentive system can help firms to achieve environmental goals (Lothe et al., 1999) where the system motivates managers and employees to focus on both financial-related activities and environmental-related activities. According to Gabel and Sinclair-Desgagne (1993), the integration of environmental matters into incentive systems will encourage managers to move towards environmental management practices. Therefore, developing an incentive system is one of the systems that can facilitate managers' commitment and employees' involvement in becoming more interactive in practising environmental management. Thus, this study argues that the incentive or reward system should be one of the indicators to measure the interactive control system.

### **3.3.3.2 Budgeting Control System (BUDGET)**

Budgeting is an important control mechanism in almost all firms (Abernethy and Brownell, 1999; Sharma, 2002; Bisbe and Otley, 2004; Henri and Journeault, 2006). Abernethy and Brownell (1999) suggest that budgeting is a management tool to coordinate and communicate strategic objectives to managers and employees.

In the context of environmental management, Henri and Journeault (2006) mentioned that environmental budgeting involves environmental costs or expenses, income and investments. All the costs and gains incurred in relation to environmental activities, such as revenue gained from the environmental activities and environment-related investments should be put in the budget (Henri and Journeault, 2006).

Environmental budgeting, in an environmental management context, also can be discussed in terms of environmental cost control. In order to achieve a better environmental performance, firms must control their environmental costs or expenses and make sure that environmental revenue will exceed the environmental expenses or costs (Hansen and Mowen, 2000). Hence, there is a need for sound environmental cost information. Such information can be found in a proper budgeting schedule. Baba (2004) stated that firms will differently define their environmental costs depending on how they intend to use such information. Baba (2004) mentioned that the aim of reducing environmental expenses, increasing revenues and improving environmental performance requires managers to pay attention to current, future and potential environmental costs.

According to Burrit (1997), cost allocation should be linked to a cost object such as a particular product produced by the organization. He said that by allocating environmental costs to the product or process that generates the costs, firms can motivate their employees to find creative pollution prevention techniques that will lower costs and return the highest profit.

Therefore, the current study uses the concept of environmental cost control to define environmental budgeting control, where it is associated with the detection, remediation and prevention of environmental degradation. The expense, revenue and investment related to environmental activities are taken into account in the context of environmental budgeting control. This concept has also been used by Baba (2004) and Henri and Journeault (2006) in their studies.

### **3.3.3.3 Environmental Information System (EIS)**

Based on Simons' (1995) definition, an information-based system became a management control system when firms used the information to maintain or change the way firms conduct their operations and activities. Simons (1995) mentioned that in order to implement strategy, top management needs information about strategic plans from lower firm's level (for example, subunit level such as marketing or operation managers). Lower firm levels then, will provide information regarding their department progress in achieving intended strategies and inform about the potential threat and opportunities to top management.

In relation to environmental management practice, according to Schaltegger et al. (2003), efficient environmental management requires well-designed environmental information management systems in order to guide firms to manage and control their environmental management strategy. In order to instigate environmental information management systems to control environmental strategy, firms have to develop specific tools to collect the necessary information (for example, information with



regards to environmental costs), such as environmental auditing and environmental accounting (Ginoglou et al., 2003).

The environmental information management system also can be classified as a tool which collects and discloses information regarding environmental performance. Henri and Journeault (2006) called the system a performance measurement system but in different dimensions, namely diversity<sup>19</sup> of measurement and use<sup>20</sup>.

The main use of environmental auditing is as a checklist (Schaltegger et al., 2003). According to Pearson et al. (1993), an environmental audit means ensuring the firm's activities comply with legislation and the audit will inspect the adequacy of the firm's systems. However, sometimes, the systems will be confusing, especially, when they are new systems. On the one hand, as Klassen (2000) mentioned, management systems are infrastructural and normally relate to broader new policies and procedures, such as implementing an environmental audit, reviewing the periodic analysis and maintaining an environmental life cycle.

On the other hand, Eco-Management and Audit Scheme (EMAS) (2007) defines environmental audit as a management tool comprising of a systematic documented, periodic and objective evaluation of the performance of the firms' management system and process designed to protect the environment with the aim of facilitating management control of environmental practices.

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<sup>19</sup> Diversity of measurement refers to the content of performance measurement systems (Henri and Journeault, 2006).

<sup>20</sup> Use of measurement refers to the extent to which performance informations are used by managers for environmental management (Henri and Journeault, 2006)

According to Baba (2004), firms should demonstrate environmental responsibility. Synonymous with environmental responsiveness, the environmental audit is one of the agenda items that promote 'green management' in firms. According to Rezaee (2000), environmental audit is a management tool allowing continuous monitoring and control of a firm's environmental performance. As suggested by Maltby (1995), the environmental audit can be one of the possible strategies for firms to monitor and minimise risks and therefore, it should be performed by staff who are within the firm but who are independent of the areas being audited and the staff should report directly to top management.

MS ISO 14010 is a Malaysian Standard and it was prepared by the national sub-committee on environmental management systems and environmental audits. This Malaysian standard was adopted in total from ISO 14010. It provides procedures for the conduct of environmental management system audits. Based on SIRIM 2000, this standard is applicable to all types and sizes of organisations operating an environmental management system (Baba, 2004).

Referring to ISO 14010, an environmental audit is a systematic documented verification process of objectively obtaining and evaluating audit evidence to determine whether specified environmental activities, events, conditions, management systems or information about these matters conform to audit criteria and that communicate the results of this process to the client.

However, not many firms in Malaysia disclose environmental information in their annual report. As Baba and Hanefah (2001) mentioned in their study of Malaysian companies, only a small percentage of firms that are listed on the Bursa Malaysia report environmental-related matters in their annual report.

Since the environmental audit plays a vital role in monitoring environmental performance, the study examines whether the environmental audit can enhance environmental performance and what its relation to environmental management strategy is.

Besides an environmental audit, environmental accounting and reporting are also mentioned as environmental information system tools. In general principle, the accounting approach is to seek and to identify where a resource, such as energy is used and to measure it, allocate responsibility for controlling it to a named individual and then to build this information into the regular monitoring processes to secure improvements. According to Kreuze and Newell (1994), more accurate costing can help improve the prices charged for products and can make visible environmental costs which were previously hidden in overhead costs. Therefore, it is argued that by collecting the accurate environmental cost data through the application of environmental auditing and accounting assists the firms to monitor environmental performance.

It may also form part of the business case for the adoption of an environmental policy by the firm. However, there is a problem in the environmental area since Bebbington et al. (1994) suggest that the practice of environmental accounting is not widespread and it is often carried out by non-accountants. According to Schaltegger et al. (2003), all management activities rely on or are at least influenced by accounting information. Based on their opinion, environmental accounting is the application of the established tools of accounting such as tools of information management, analysis and communication to environmental management.

Generally, environmental accounting can be judged as one of the main tools of the environmental management systems. The information which was counted in environmental accounting should be communicated to interested parties such as stakeholders, through proper reporting. Initially, as Azzone et al. (1997) stated, the firms publish an environmental report to show their commitment to environmental problems. The environmental report will then play a vital role in communicating environmental performance to outsiders, to differentiate their firm from competitors (Li et al., 1997), to legitimise the firm's activities (Patten, 1992) and to prove the firms compliance to the environmental rules and procedures, such as ISO 14001 or EMAS.

Corbett and Cutler (2000) said that firms face more pressure from their stakeholders (such as investors and shareholders) to disclose their environmental practices and the impact of those practices on their firms performance in more detail. However, Jaafar

(2001) suggested that environmental information needs only to be disclosed if the information is relevant to the decision making process.

According to Jaafar (2001), the firms' size can influence the level of environmental information disclosed in annual reports. As the vital role of environmental accounting is to provide the information to the stakeholder in order for them to make a decision, the current study defines an environmental information system as one which is based on environmental audit and reporting.

#### **3.3.3.4 Cultural Control System (CULTURE)**

Firm culture comprises the pattern of values, beliefs and norms which are shared by the members of a firm, and which consequently tend to influence the ideas, behaviour and actions in their everyday work. Simons (1995) argued that firm culture can boost or hinder firm performance; therefore, management should consider management control system design which changes the culture of the firm.

Flamholtz (1983) has suggested that a failure by management to design management control systems which are consistent with their firm's culture can lead to active resistance to the control system. Such resistance could then potentially result in the ultimate failure of the control systems and will seriously hinder the firms' progression towards its goals and objectives.

According to O'Reilly and Chatman (1996), many firms succeed because a firm's culture is very difficult to imitate and develop. Therefore, firms that have good culture will often gain sustainable competitive advantage. O'Reilly and Chatman

(1996) suggested, that good and well-performing firms normally have several features of culture such as a flat firm structure, decentralisation and high levels of employee involvement; high levels of staff motivation; employee initiative and creativity in problem solving; rewards for achievement; a company culture that values efficiency and effectiveness; a pro-active attitude when dealing with new ideas; continuous effort by employees to plan ahead, reduce uncertainty and minimise risk; team work and the use of committees to steer the implementation of quality initiatives.

A recent study by Henri (2006), has defined culture based on value structure. This value will create a shared meaning among people in the firm and thus, produce similar behavioural norms. Based on Rousseau (1990) cited in Henri (2006), a firm's culture can be captured by its subjectivity and accessibility. These two continuums provide different measurements as to whether a culture can be seen to be quantitative or qualitative.

Henri (2006) discussed value under the control and flexibility dilemma. His work states that, control value refers to predictability, stability, formality, rigidity and conformity. This type of value seems strict, tight and focuses on forcing through strategy such as compliance to the law and regulations and moving toward achieving goals. While, flexibility value refers to spontaneity, change, openness, adaptability and responsiveness. This value is associated with loose and informal control, open and lateral channels of communication and free flow of information throughout firms. These types of value are similar to Burns and Stalker's (1961) development culture which mentioned that this culture depends on adaptability and readiness to attain growth, innovation and creativity.

This study uses the definition given by Henri (2006; 80) where culture is defined as *the shared values that interacts with the firm's structure and management control system and leads to behavioural changes*. Consequently, this study uses culture from an environmental management perspective, where the firm's environmental culture means people in the firm will share the environmental information which creates and builds the same value within firms. Thus, the value is able to change the behavioural aspects of the people in the firm in order to implement environmental management practices.

### **3.4 Other Variables Related to the Study**

Other than the variables mentioned in the previous subsection, there are several variables that can be categorised as control variables in relation to management control systems and environmental management practices or strategy, such as size, structure and chain affiliation.

#### **3.4.1 Size (SIZE)**

The size of an organization is an important factor to be considered in the design of effective control systems, especially as Baba (2004) said that most firms delegate more as they grow. Merchant (1981) established that in larger firms, an administrative approach to management control can be linked to better performance, while in smaller companies, personal control systems are likely to be more effective. Lafontaine (1998), as cited in Marquet-Pondeville (2001), pointed out that a firm size has a positive link with the presence of environmental information in annual reports and thus, leads to better environmental performance.

In the environmental literature, according to Aragon-Correa (1998), Morgan et al. (1999), Christmann (2000) and Theyel (2000), there is a relationship between size and environmental management practices. They argue that the majority of studies on environmental management have focused on large firms. Other studies also argue that large firms are expected to be under more pressure to apply environmental management because their environmental impact is more visible (Henriques and Sadosky, 1996) and they have more resources to invest in environmental protection and prevention (Sharma and Veredenburg, 1998; Carmona-Moreno et al., 2004).

As Morgan et al. (1999) suggested, larger small-medium (SME) firms will tend to adopt ISO 14000 as they have more resources. On the other hand, Merrit (1998) mentioned in her study on SME firm that large firms usually apply more formal management and therefore, this would be expanded to more formal environmental management. Besides, in the similar context, Andersen (1997) stated that large firms have economies of scale for the re-use, recycling or valuation of waste.

Levy (1995) also suggested that larger companies in the small-medium enterprises tend to release more information on environmental policies and programmes. This is confirmed by a study done by Gupta (1995) which suggested that the stage of information diffusion of environmental management practices is dependant on the nature and size of the firms. Similarly, Baylis et al. (1998) reported in their study that large firms are more aware than small and medium firms of environmental obligations and environmental pressures. For all these reasons, the current study can expect large



hotels to be more likely to adopt proactive environmental management practices than small hotels.

Baba (2004), however found in her study of manufacturing firms in small-medium enterprise that the size of a firm was not a significant predictor of environmental management practices and environmental performance. It may be that large firms have a formal procedure (Gil et al., 2001) in order to practise environmental management. Conversely, Lafontaine (1998), as cited in Marquet-Pondeville (2001) has pointed out a positive link between firm size and the presence of environmental communication in annual reports.

Size could also be a significant explanatory variable of the adoption of management control systems, particularly those related to the management of human resources (Davila, 2005). Additionally, Sharma (1999) found that size has a significant effect on budget systems but does not significantly influence firm structure.

Although most studies have looked at large firms, the samples differed from study to study in terms of both size and industrial composition. As Adams et al. (1998), Cowen et al. (1987), Patten (1991) and Trotman and Bradley (1981) stated that although some relationships between size and environmental management practices have been identified, differences in country, time period and other explanatory variables make generalisation difficult.

Considering the conflicting results of previous studies, this study is going to look at the impact of size on the practice of management control systems and on environmental management activities. For the purpose of comparison, medium and large sized hotels were considered in the model for the study.

### **3.4.2 Structure (STRUCTURE)**

A firm structure is developed when a firm employs more than one person in the firm. Firm structure should be developed appropriately because an inadequate structure will lead to incorrect decision making. Child (1984) mentioned that the basic structure allocates peoples to tasks for which they have responsibility. Firm structure is one of the elements of the strategic fit where according to Drucker (1977), to be effective, a firm should be 'doing the right things'.

Based on a study by Henderson and Venkatraman (1992), strategic fit relates to how a firm balances its internal and external needs. They argue that firms need to make choices to put them in the external market and at the same time, should balance the structure of the firm internally to execute the strategy. In addition, Meijaard et al. (2002) stated that there is still a continuous debate on how to design firm structure because strategy, structure and performance have some inter-relationships and in their view, implementing an adequate structure is one of the most important challenges a firm faces. This could be required to fulfilling and to balancing the needs of firms and their strategies.

A number of typical types of firm structure have been identified by management theorists. Building on the premise that each firm should have the speciality in decision making, tasks and activities, the types of the structure of the firms could be based on centralisation or decentralisation, vertical or horizontal structures and functional or geographical grouping. The underlying concept of firm structure is similar even though some of the researchers use different terms to explain it.

Barth (1999) and Fowler (2001) define firm structure based on its complexity, formalisation and centralisation or decentralisation. Their view is that, complexity refers to the degree of horizontal (number of occupations), vertical (number of levels) and spatial (geographical dispersion) differentiation. Formalisation relates to rules and procedures, while centralisation and decentralisation refers to the level of management decision-making. Although Meijaard et al. (2002) examined firm structure from a similar view point, they gave it a different term, i.e. work division and coordination mechanism. Based on Meijaard et al. (2002), work division refers to how people in the firm distribute tasks and activities, while the coordination mechanism concentrates on how people in the firm coordinate decisions, whether through a standardised or formal approach.

Gordon and Narayanan (1984), on the other hand, viewed firm structure based on Burn and Stalker's (1961) view of mechanistic and organic characteristics. They adapted questions from the seminal work of Khandawalla (1972, 1977) which used a seven-point scale. Burns and Stalker's (1961) view as cited in Robbins et al. (1994), and Gordon and Narayanan (1984), also underlies their construct on the complexity,

formalisation and centralisation or decentralisation measurement. A 'mechanic structure' is one that has high complexity, high formalisation, formalised communication and centralised decision-making. Conversely, an 'organic structure' has low complexity, low formalisation, an informal and extensive network and decentralised decision-making. According to Robbins et al. (1994), the larger the firm is, the more formal the control system needed and hence, the more mechanic a firm becomes.

Firm structure is an important element that influences the management control process and the information required for management control systems (Bell and Burnham, 1989; Fowler, 2001). According to Bell and Burnham (1989), firm structure is a critical and vital component of a management control system because it shows and determines how activity and communication should behave.

Research carried out by Hopwood (1972) and Otley (1978) concerning the impact of firm structure on the management control system process, suggested that an effective management control system will particularly reflect the degrees of interdependences between responsibility centres. They argue that as interdependences increase, flexible management controls are likely to be more effective than more formal, rigid controls. However, according to Robbins et al. (1994), the impact of firm structure on the management control system depends on behavioural aspects such as personnel and culture aspects.

In an environmental sense, the internal structure of a firm tends to follow the increase in environmental involvement. It seems that the larger the firm, the greater the increase in the number of functions in the firm which, therefore, will affect the environmental management practices of the firm. As Fryxell and Vryza (1999) stated many large firms have built a separate environmental department connected to other departments, for example, Security and Hygiene departments. Quazi (1999) also mentioned that firm structure is a critical success factor for environmental management.

According to Byrne and Kavanagh (1996) and Berry and Rondinelli (1998), firms who are involved, proactively, in environmental issues tend to follow a decentralised approach to environmental management. Berry and Rondinelli (1998) mentioned that all departments have to implement environmental policies to integrate the environmental perspective into the firms' culture and into everyday decisions.

Firm structure is related to firm culture and firm size. Hall (1972) suggested the structure of the firm relates to the context in which it operates, such as firm size, technology, internal culture and climate, the environment and national cultural factors. Hall's suggestion is also supported by Barth (1999) and Fowler (2001).

A considerable number of studies conducted in the 60s and 70s (for examples Pugh et al., 1968 and Child, 1972) mainly used empirical data from large firms. Large firms show different management styles and implementation compared to small firms. In large firms, functional departments are independent, thus co-ordination of tasks

between departments could be hard to implement. However, practically, top managers in large firms who involved in decentralised decision making have an impersonal management style through which they develop control systems, standardised reporting and other formal procedures to ensure the recording of information. In contrast, management in small firms does not involve large numbers of staff and therefore, managers can use a personalised style, with centralised decision-making. As confirmed by Routamaa's (1980) study on the Finnish shoe and clothing industry, small firms tend to rely on managers for coordination and control.

The current study refers to firm structure based on the Gordon and Narayanan's (1984), Barth's (1999) and Fowler's (2001) perspective. Complexity here refers to vertical differentiation, while formalisation, on the other hand, refers to the use of rules and formal procedures in a firm. The last dimension, centralisation refers to the distribution of the power within the firm.

### **3.4.3 Chain Affiliation (CHAIN)**

Chain affiliation is one of the terms which is applied to service industries in order to explain the series of activities involved. According to Carmona-Moreno et al. (2004), referring to the hotel sector, chain affiliation will standardise the form in which certain activities of a hotel's management are carried out. In other industries context such as manufacturing, Delmas and Toffel (2005) said that industry associations motivate firms to adopt environmental management practice.

The techniques that chains use to unify their activities can also help to transfer skills and knowledge between them. According to Carmona-Moreno et al (2004), a series of activities carried out by chains will help their components to know how they can protect their environment. On the other hand, the chains can also provide the components with training in environmental protection techniques and help the components with skills and knowledge about areas such as ecological customers and markets (Carmona-Moreno et al., 2004).

However, sometimes the reaction to environmental management may differ in various parts of the world, even within the same industry and sector. As mentioned in 3.4.1, differences between countries make environmental practices difficult to generalise. One of the reasons may be that the long distance from home base may reduce a firm's authority to control practice. On the other hand, the local government policy may also be one of the barriers to implementing environmental practices. As Blair and Hitchcock (2001) said, one indication of whether businesses are applying environmental practices is the policy they adopt. However, different countries have different government policies (see Adams et al., 1998; Cowen et al., 1987; Patten, 1991 and Trotman and Bradley, 1981), therefore, it is difficult to say that all firms across countries adopt the same policy and procedure.

As this study uses the hotel industry as a unit of study, whether the environmental management practices and management control systems are correlated with chain affiliation is examined.

### 3.5 Environmental Performance (ENVPERF)

In general, environmental performance is based on the ISO 14031 where this standard provides the guidelines to evaluate the environmental performance of firms. According to Schaltegger et al. (2003), ISO 14031 has been approved throughout the world.

As cited in Schaltegger et al. (2003), ISO 14031 proposes three types of indicators to evaluate performance; the environmental performance indicator (EPI), the environmental management indicator (EMI) and the environmental condition indicator (ECI). However, only EPI and EMI are recognised by ISO 14031 as indicators of a firm's environmental performance.

Environmental performance is the interaction between business and the environment. The benefit and damage to the natural surroundings brought about by firms' activities is mentioned in relation to environmental performance. James (1994) identifies ten ways of measuring and operationalising a firm's environmental performance and each way is categorised by different aspects, such as impact, risk, pollution, activities, resources, efficiency, client, standardisation and aggregation. Miller and Szekely (1995) in their study of environmental performance discussed the stakeholder point of view where they found that stakeholders of firms measure environmental performance using one or several criteria mentioned by James (1994). According to Miller and Szekely (1995), one of the measures most often used in relation to environmental performance is the environmental initiatives carried out. For example, Theyel (2000) defined environmental performance based on the effectiveness of the firms' activities



or processes in reducing waste generation of chemicals used by plants in the Plastics and Resins and Ink manufacturing sectors.

The other study that contributes towards systematising the dimensions to be included in environmental performance is that of Ilinitch et al. (1998). They integrated the elements of the model of Wood (1991) and Lober (1996) to measure environmental performance and developed the matrix of criteria to evaluate a firm's environmental performance using 2 x 2 dimensions; process, output, internal and external (refer to Figure 3.4).

**Figure 3.4:**

**Matrix of Criteria to Evaluate a Firm's Environmental Performance**

	Internal	External
Process	Organisational systems	Stakeholder relations
Output	Regulatory compliance	Environmental impacts

*Source: Ilinitch et al. (1998; p388)*

Ilinitch et al.'s (1998) model shows that the internal organisational system measures refer to the activities or processes designed to improve firm's performance. An external stakeholder relation refers to the interaction between the firm and external agents, while external environmental impacts include the negative spill over the firm's activities have on environment. Finally, the internal regulatory compliance refers to the degree to which the firm observes the minimum requisites established by certain norms or laws.

In the hotel sector, Burgos-Jimenez and Lorente (2001) stated that the objective of environmental performance should be understood as reducing the negative effect on the natural environment that is initiated by the activities of the hotels. Similarly, Carmona-Moreno et al. (2004) defined environmental performance as the activities and processes that were designed to minimise the negative impact on the natural environment which is caused by the productive activities of a company and how people in hotels perceive that associated impact. They focussed on internal processes in evaluating hotel's environmental performance.

Several advantages of environmental performance improvement have been highlighted from the literature (see Guimaraes and Liska (1995) and Shrivastava (1995)) such as cost reduction (efficient use of raw materials, reduction in environmental pollution's fines, insurance cost), quality improvement, improved firm image, access to new markets, engaged competitiveness and improved stakeholder communication.

The current study refers to environmental performance based on Ilinitich et al.'s (1998) definition but only focuses on internal processes such as in Carmona-Moreno et al.'s (2004) study. As this study is an exploratory study and focused on management control system, there is no intention to give an objective measurement for the environmental performance.

### **3.6 Empirical-Related Study**

This section reviews empirical research on whether there is a relationship between environmental management practices, management control systems and environmental performance.

#### **3.6.1 Environmental Management Practices and Management Control System**

A study of the relationship between environmental management practice and management control systems can be discussed using the view of contingency theory. The theory of contingency has been discussed in much management accounting literature such as Langfield-Smith (1997), Simons (1995) and Otley (1980) as a theory which suggests that the design and use of management control systems is influenced by or contingent upon certain factors such as strategy (internal) or external environment to the firm. In addition, Tekavcic et al.,(2005) argue that strategy represents a very important contingent variable. Langfield-Smith (1997) also mentioned that much of the empirical research in management control literature used case study methods to examine the role of management control system in supporting the strategy of the firm.

As previously discussed, much of the research in environmental management literature uses environmental management practices to represent an environmental strategy in a firm. Roome (1992) and Hunt and Auster (1990) proposed that firms' environmental strategy should be classified based upon their environmental management practices and according to Carmona-Moreno et al.(2004), environmental management practice is one of the important factors in defining environmental

strategy<sup>21</sup>. However, empirical study which examines the relationship between environmental management practices or strategies and the management control system is a relatively scarce and unexplored area. Simon (1990) argued that the understanding of the relationship between strategy and management control system is still being researched and the field is limited. Even though, Langfield-Smith (1997) mentioned that the role of management control system in the implementation of strategy is becoming of greater interest, up to now, there has not been much research done to examine this relationship from an environmental management perspective.

Earlier studies in the management control literature using contingency theory, such as Widener (2004), Bisbe and Otley (2004), Paul et al. (1999), Simons (1987, 1990, 1995), Govindarajan and Gupta (1985) and Miles and Snow (1978) noticed that there is a matching fit between a firm's strategy and its management control system. Miles and Snow (1978) mentioned that strategy choice will affect a firm's management control system.

Widener (2004) studies the relationship between strategy and the design of management control systems. Data was collected from 107 managers in large manufacturing firms in the U.S. Widener (2004) used a combination of management control system elements, namely personnel control, non-traditional result control and traditional result control. She found that the strategy implemented had influenced the design of management control systems.

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<sup>21</sup> The words 'strategy' and 'practice' will be touched upon later in the discussion of empirical literature have the same meaning and will be used interchangeably.

This finding on the relationship of strategy and management control systems is supported by Bisbe and Otley's (2004) study on the effect of the interactive use of management control systems (namely performance measurement system, budgeting and project management) on strategy (product innovation) in the Spanish small-medium manufacturing industry. However, their findings contrast in terms of the consequences of the relationship, which is either strategy influences management control system design or management control system influences the design of strategy. Bisbe and Otley (2004) found that there is a significant relationship between management control systems and product innovation in high-innovating firms but in the opposite way. In other words, the findings show that the management control system leads to strategy design in achieving a better performance.

Earlier, Paul et al. (1999) also examined the relationship between the management control system and strategy. They used public sector entities (Pathology) in Western Australia as a unit analysis<sup>22</sup> and general management strategy following Miles and Snow's (1978) typology as a proxy of strategy discussed. The data collection was done using a questionnaire survey to senior and middle management, documentation and interview. The result of this study showed a match between management control systems and strategy. It was also argued that this relationship will enhance performance. Their finding is consistent with Simons (1987 and 1990).

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<sup>22</sup> Unit analysis is a basis of study. It will be discussed in depth in the Methodology Chapter (Chapter Five).

The seminal work of Simons (1987) also used survey questionnaires and interview-based techniques to collect the data on the extent of differences in the control system followed in business strategy<sup>23</sup>. He found that firms following different strategies employ different ways of control system and the nature of the control system employed will differ between types of business strategy (i.e, prospector and defender). However, it is not clear in this study whether the management control system changes as a consequence of change in strategy or conversely, the management control system facilitates changes in strategy (see also Simons, 1990; 1994). Simons (1987, 1990, and 1995) also did not identify the role played by the management control system.

Furthermore, Banker et al. (1993) investigated the linkage between the adoption of new manufacturing practices as a strategy and the management control system. They referred new practice in their study to the total quality management practice. Banker et al. (1993) used 362 workers from forty plants located in the U.S. and found that the introduction of new manufacturing practices (or strategy) has a strong positive relationship with the management control system.

Daniel and Reitsperger (1991) also noted that there is a relationship between strategy and management control systems. They found that firms use different management control systems for different strategy. They mentioned that only a few empirical studies have focused on how management control systems have been modified to complement new management practices. They used quality strategy as a proxy for strategy and collected data using a mixed method approach; survey questionnaires and

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<sup>23</sup> Strategy can be classified in two ways, corporate strategy and business strategy. Both types of strategies have been discussed in detailed in Section 3.2.2.

site visits. They also suggested that the consistency between strategy and the management control system may be vital to the firm's performance. However, no hypothesis related to the management control system and performance was tested by this study.

From the above discussion, a few conclusions can be drawn. First, all of the previously mentioned studies found there is a relationship between practice or strategy and the management control system. Even though, there is still in doubt whether the former follows the latter or vice versa, the current study argues that practice or strategy always influences the way the management control system is designed. This argument is due to much study carried out on the issues of the issues of strategy and management control system which confirms the relationship (for example, Widener, 2004; Langfield-Smith, 1997; Daniel and Reitsperger, 1991). Secondly, the previous studies also used manufacturing firms or small-medium industries as a unit of analysis. No literature under investigation mentioned the study of service-based firms. Therefore, the current study argues that the framework of the relationship between practice and performance can also be applied to the service sector, namely hotel sector. Third, most of the previous study looks at practice or strategy in general and did not look at environmental management literature. Therefore, the current study will examine the relationship between practice and management control systems in the hotel sector from an environmental management perspective.

### 3.6.2 Environmental Management Practices and Environmental Performance

A number of empirical studies have been carried out in this area examine the relationship between environmental management practices and environmental performance. Several studies such as Hertin et al. (2003) and Steger (2000) found no or little significant relationship between environmental management practices and environmental performance. On the other hand, studies such as Wagner and Schaltegger (2004), Baba (2004), Wagner (2002), Gil et al. (2001) and Theyel (2000) showed improvements in environmental performance when implementing environmental management practices. In addition, Benito and Benito (2004) found mixed results in that some practises could bring competitive opportunities to firms, while some environmental practises produce negative effects. They studied such relationship in the manufacturing industry context.

Simon and Marques (2005) identify the relationship between strategy and performance in 189 Spanish hospitality industries. They use Miles and Snow's (1978) typology to classify strategy and found that different types of strategy have different effects on performance. By using ANOVA to analyse the data, the result shows that the prospector, defender and analyser-type-strategies perform well in performance. On the other hand, reactor-type-strategy has been linked to poor financial performance.

The finding above is supported by the research of Hertin et al., (2003) on the impact of environmental management systems on the eco-efficiency of European firms in five manufacturing sectors in six European countries. They used non-parametric tests



to analyse the data and found a relationship between environmental management systems and environmental performance. However, there is little evidence to suggest that firms with environmental management systems will perform better than firms without such systems. The possible explanations of the results may be due to environmental management systems not being a strong driver of environmental performance. The effect may be contingent on other stronger determinants of environmental performance, such as the management control system. For example, Benito and Benito (2004) mentioned that different types of practices will have different impact on performance. They classified environmental management practises based on three practices, such as planning and organisational practices, operational practices and communicational practices.

Steger (2000) reviews twenty-four empirical studies of the relationship between environmental management practices and improvements in environmental performance in Germany and Austria. He found that environmental management practices (i.e. environmental management systems) does support compliance with the environmental legislation and thus, lead to a better performance. He argues that, however, it is hard to clarify the real environmental effect of better compliance because the practices are normally associated with rules and regulations, such as formal or non-formal procedures.

From another point of view, Wagner and Schaltegger (2004) on the other hand, study the relationship between corporate environmental strategy and environmental performance in the European manufacturing industry (U.K.-based and German-based firms). They used shareholder view as a basis to proxy environmental strategies and

they used the survey method to collect the data. They found that environmental performance is higher in firms with environmental strategies than firm without such strategies.

A study carried out by Baba (2004) also suggests that there is a relationship between environmental management practices and environmental performance. She used a mail questionnaire survey method in small medium industries in Malaysia. Baba (2004) reports that all the variables of environmental management practices, which are pollution prevention technology, environmental auditing and environmental quality management programmes have a positive significant effect to environmental performance.

Carmona-Moreno et al.,(2004) in their study on the environmental strategies adopted in the service industry (i.e. a total of 268 Spanish hotels) also suggest that environmental management practices (based on environmental protection activities) improve environmental performance such as lower risk and liability, reduced waste and discharge and improved 'green' image.

Furthermore, Wagner (2002) in his comparative study of firms in Germany and the United Kingdom identifies sets of environmental management activities which influence environmental performance. Based on a questionnaire survey of a random sample of firms in the manufacturing sector in both countries, he found that environmental management activities, environmental regulation and firm size significantly influence environmental performance. An earlier study done by Theyel (2000) also found that there is a positive relationship between environmental

management practice and environmental performance. Based on the U.S chemical firms' data which was collected using survey and phone interviews, he found that firms with the highest adoption levels of environmental management practices such as total quality management, employee involvement and pollution prevention plan had the highest environmental performance, where those practices can lower the costs of the production process by reducing waste and the cost of the environmental compliance by preventing pollution from the start.

While a work done by Hamschmidt (2000) at 158 Switzerland Swiss Agency companies on the extent firms perceived improvement in their environmental performance, found that sixty percent of firms perceived small improvement, ten percent thought their environmental management systems had led to an increase environmental performance and the remaining thirty percent experience deterioration or found it difficult to make a judgement.

The mixed findings of empirical studies on the relationship between practice and performance may also be due to many studies focussing on the link between environmental management practices and financial and economic performance, whilst not specifically looking at environmental performance. According to Hertin et al. (2003), cost-benefit analysis can in fact be achieved without reducing any environmental impact, such as reducing pollution. Hertin et al. (2003), therefore, suggest that benefits of environmental practice are not the best indicators of financial performance.

Benito and Benito (2004) support the argument put forward by Hertin et al. (2003) above. Benito and Benito (2004) analyse the relationship between proactive environmental management practice and business performance in a sample of 186 manufacturing industrial companies (i.e. chemical sector, electronic sector and furniture sector). They found mixed results where on one hand, the analysis supports the argument that proactive environmental management practice leads to competitive advantage and on the other hand, some environmental management practice produce negative effects on business performance. Drawn from those conflicting results, they conclude that not all the environmental practice yield similar benefits, rather, outcomes depend upon what type of environmental practice which has been implemented.

Gil et al. (2001), however, found that there is a significant difference between the financial performances of active environmental management practices. They study such relationships within the Spanish hotel industry. They found that there are several benefits in performance achieved by integrating environmental issues into firm strategy, such as cost savings and improvements in firm efficiency, product quality improvements and also increases in market share.

In summary, there are mixed findings from the past literature on the relationship between environmental management practice and environmental performance. This may be due to different industries, different countries and different measurements of the practices. The current study, therefore, will examine the relationship between environmental management practice and environmental performance in the Malaysian

industry (the hotel sector), in order to see whether the previous findings can be applied to the current study.

### **3.6.3 Management Control System and Environmental Performance**

Most discussions on the relationship between management control systems and performance focus on firm or business performance in general. For example, Govindarajan and Gupta (1985) examine the relationship between the management control system (i.e. incentive bonus system) and performance by looking at fifty-eight strategic business units. They found that there is a significant relationship between management control systems and performance where an increase in performance should result from the better bonus system. Hunt and Auster (1990) proved the argument above in relation to environmental management. Even though they are not specifically looking at management control systems, they suggested that bonus incentives based on environmental performance will help to translate and communicate goals and objectives into day to day operation and also indirectly, establish responsibilities for environmental problems.

Abernethy and Brownell (1999) also examine the link between the management control system and performance. They used the hospital sector and employed a cross sectional approach to empirically investigate the use of budgets (as proxy of management control system) on performance. Their finding suggests that the interactive use of budgeting had a positive effect on the performance.

Bisbe and Otley (2004) in their study on small-medium Spanish manufacturing firms found that there was no indirect effect of the interactive use of management control

systems on performance through innovation, but the style of use of management control systems moderate the relationship between innovation strategy and performance. The study suggested that management control systems should be designed and used explicitly to support the strategy of the business and this leads to superior performance (see also Chenhall and Langfield-Smith, 1998; Govindarajan and Gupta, 1985; Simons, 1987, 1990). Even though Bisbe and Otley's (2004) study investigates the relationship between strategy, management control system and performance, this relationship is looking at innovation perspective and business performance and not at the environmental management perspective.

A research study carried out by Tekavcic et al.(2005) examines the relationship between management control systems, strategy and performance in general context. They refer strategy to the typology introduced by Miles and Snow (1978) and Porter (1980) to examine the relationship. Tekavcic et al. (2005) used the case study method in a Slovenian manufacturing company and suggested the proposition that the use of more comprehensive management control systems will improve firm performance.

In environmental management literature, a recent study by Henri and Journeault (2006) examines the extent to which management control systems influence environmental performance in Canadian manufacturing firms. They used performance management system, budgeting and incentives to represent management control systems in manufacturing firms. They suggested that management control system elements (budgeting and incentives) positively influence environmental performance but they do not clearly discriminate the role of management control systems in the relationship.

Even though past literature mentioned an improvement in performance during the implementation of environmental management practice, such as Kuisma et. al. (2001), Hamschmidt (2000) and Steger (2000), the improvement was not detailed in a comprehensive way. In other words, some of the strategies will have shown significant improvement, while others will not have a significant positive effect. This finding put forward the idea that even though firms follow an environmental management standard (for example, EMAS) to help firms to implement the best practice or strategy, the imposition of management control systems might improve environmental performance (see Hertin et al., 2003).

Due to a lack of empirical research in terms of the relationship between management control systems and performance from the environmental management perspective, especially in the service-based sector, the current study will investigate empirically new ground by looking at the relationship between management control systems and environmental performance in the hotel sector. The roles of management control systems in the relationship between environmental management practice and environmental performance are also being examined.

### **3.7 Chapter Summary**

This chapter has reviewed the literature on all the related concepts of environmental management practices, management control systems and environmental performance. The discussion on the topic will be used as guidance for developing the hypothesis and theoretical framework for the current study. The empirical study for each

variable will be discussed in detail in the next chapter in order to facilitate the hypothesis development.

From the review of the literature, a few theoretical conclusions can be drawn and can be summarised as below:

- It has been reported in the previous studies that there is a relationship between practice or strategy and management control systems. However, there is still in doubt whether the former follows the latter or vice versa.
- Previous studies used manufacturing firms or small-medium industries as a unit of analysis. Only a few studies under investigation of this relationship, i.e. environmental management practice and environmental performance were undertaken at service-based firms.
- Previous studies of management control literature looking at the management practice or strategy in general and do not specifically examine at environmental management practices.
- There are mixed findings from the past literature on the relationship between environmental management practice and environmental performance. This may be due to different industries, different countries and different measurements of the practices.
- Most of the discussions concerning the relationship between management control systems and performance focus on firm or business performance and there is a lack of empirical research on environmental performance.
- Previous framework does not provide clear picture of the relationship among variables involved. The discriminating of the effect of management control



system on the relationship between practice and performance was not comprehensively carried out.

- Size, chain affiliation and firm structure are considered as a control variable to environmental management practices and management control system and have a significant influence on them.

## **Theoretical Framework and Hypotheses Development**

### **4.1 Introduction**

The previous chapters discussed in detail the concept of management control systems and the associated link to environmental management practice. The effect of management control systems on the relationship between environmental management practice and environmental performance is also discussed. The aim of this chapter is to discuss and justify the relationship from a theoretical perspective, followed by the hypothesis development to facilitate an investigation concerning the relationship between practice, management control systems and performance from an environmental management perspective.

The chapter starts with discussion about the theoretical framework in Section 4.2, which is based on previous environmental management and management control literature. Section 4.3 discusses the conceptual model and the development of the hypotheses, in order to investigate the relationship between practice, management control systems and performance in the context of environmental management. Lastly, Section 4.4 summaries all the discussion.

### **4.2 Theoretical Framework**

Clarkson (1995) mentioned that utilising a theoretical framework is important and useful to clarify the research concept and construct. The theory of contingency is one of the theories which are frequently and broadly used in management control literature. Dent (1990) stated that the contingency approach has become the dominant theme in management control system research.

However, in environmental management literature, there are several theories that explain the commitment of the firms in terms of environmental management issues. Among the important theories in the environmental management perspective are the legitimacy theory and the stakeholder theory. All of the relevant theories are discussed in the next section.

#### **4.2.1 The Contingency Theory**

The contingency theory argues that design and use of management control systems is contingent upon the specific circumstances of the setting in which the control system is operated. This idea is discussed by Emmanuel et al. (1990) where the contingency theory is based on the premise that there is no one standard or universal management control system than can be applied to all firms in all situations. The contingency theory was drawn from the original organisational theorists. Fisher (1995) stated that the ultimate goal of contingent control research should be to develop and test a comprehensive model that includes multiple control systems, multiple contingent variables and multiple outcome variables.

In other words, different firms have different management control systems, depending on their characteristics and natures. Previously, Tricker (1976) also noted that there is no standard satisfactory management control system for all firms. This theory also implies that, as the specific situations of a firm change, the management control system should adapt if it is to remain effective.

#### 4.2.1.1 The Contingency Approach to Management Control Systems

There have been several studies that applied a contingency framework to management control systems, such as Bruns and Waterhouse (1975), Gordon and Miller (1976), Waterhouse and Tiessen (1978), Gordon and Narayanan (1984), Chapman (1997) and Anthony and Govindarajan (2001).

Bruns and Waterhouse (1975) studied the relationship between firm structure (proxy for strategy) and budgeting control systems using size and technology as their context variables<sup>24</sup>. They suggested that different types of structure strategies, either administrative or interpersonal need different types of control and were appropriate in different kinds of firm.

Gordon and Miller in 1976 used three factors to design their framework for accounting information systems. These three factors are environment, firm requirements and the management decision making style. All these three factors involve different strategies to alter the firms' orientation to fit<sup>25</sup> to the firms' objective.

Waterhouse and Tiessen (1978) argued that 'the structure of an organisation is largely dependent on its context and that different structures create a need for different control mechanisms' (p 66). They used environment and technology as contextual

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<sup>24</sup> Context variables are the variables that influence relationship between two variables or in other words the relationship is contingent on the context variables

<sup>25</sup> Venkatraman (1989) stated that the concept of 'fit' is defined in various ways in the literature, such as, consistent with contingent upon, matching, aligning or congruence.

variables and discussed the relationship between structure and management accounting systems in the contingency approach.

Gordon and Narayanan (1984) in their framework determined that information systems and firm structure are a function of the environment. They found that there is no significant relationship between the information system and a firm's structure, but they suggest that firm structure and information systems are part of management control system. Chapman (1997) also consider the contingent factor but in a broader context where he studied the effects of environment and technology on firm structure, management accounting systems and information system. He suggested that management accounting systems and information system are required as part of the management control system.

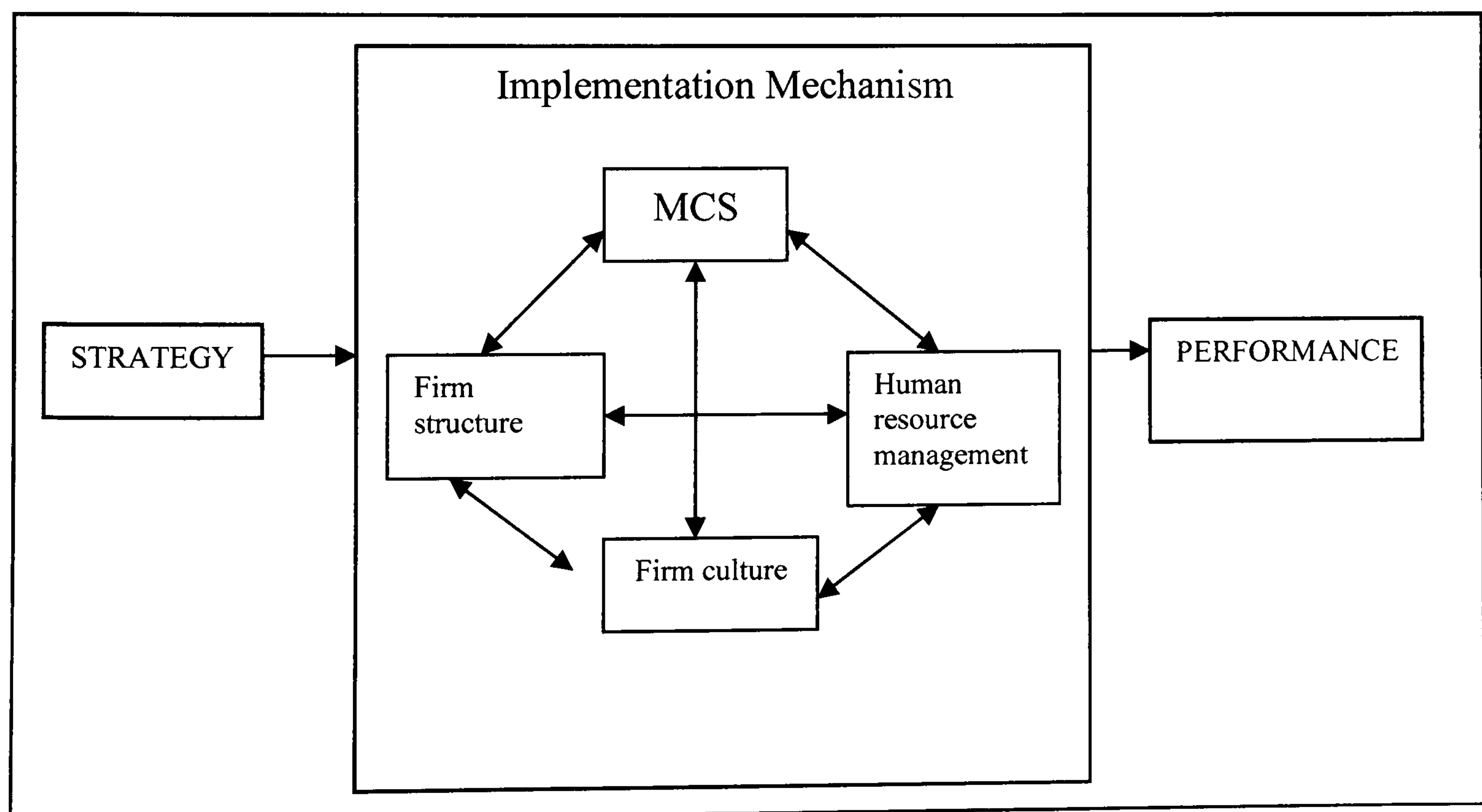
Anthony and Govindarajan's (2001) framework, on the other hand, showed the inter-relationship between the management control system, firm structure, firm culture and human resource management in order to get the management control system to work according to the strategy. They proposed that effective control systems are highly situational and that the system should be tailored to the nature of each firm.

In Anthony and Govindarajan's (2001) framework, the firm structure describes the role and responsibility of the members of the firm to make a decision within the firm. The firm culture refers to the shared beliefs attitudes and norms that explicitly or implicitly lead managerial actions, while human resource management is the selection, training, evaluation, promotion and termination of employees in order to develop skill and knowledge to boost the firm's strategy. The current study can also

be explained using this framework where when hotel sectors have a planning to put the environmental issues in their strategic plan, the hotel management should attempt to change and alter their hotel structure to complement the new environmental culture they developed. Then, as at the same time, the hotel management should develop environmental training and awareness program to boost the skill and knowledge regarding a new environmental strategy.

Figure 4.1 gives an insight into the Anthony and Govindarajan's (2001) framework for strategy implementation and how the management control system works towards implementing strategy and improving performance.

**Figure 4.1:**  
**Framework for Strategy Implementation**



Source: Anthony and Govindarajan, (2001:8)

In order to implement the intended strategy, based on Simons's (1995) framework which proposed four levers of control which were inter-related each others, i.e. belief systems, boundary systems, diagnostic systems and interactive control systems, the implementation mechanism of Anthony and Govindarajan's (2001) framework could be discussed in Simons's (1995) four levers of control.

Therefore, based on Simons's (1995) and Anthony and Govindarajan's (2001) framework, the current study defines the management control system as it relates to the environment as 'any process or action taken by hotel managers to influence the possibility people in hotels behave in ways to achieve environmental objective and to allow the emergence of new ideas and opportunities to implement hotels' environmental strategy'.

This definition limits the management control system within the internal structure of the hotel. It is means that the hotel management's or hotel's goal is to control the people in the hotel (such as hotel manager, front desk manager, housekeeper and others) to act efficiently in order to achieve the environmental objectives of the hotel. Therefore, it will involve top management and personnel to get the system to work and to place the environmental issues into hotels' day-to-day operation. The involvement of top management and employees in decision making can be discussed based on Simons' lever of control framework<sup>26</sup> (1990, 1991 and 1995).

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<sup>26</sup> Simons' levers of control framework (1990, 1991, 1995) classifies formal management control systems into three categories; belief system, boundary system and feedback and measurement systems. Furthermore, from these three formal systems, Simons distinguishes the style of management control system use into two; the diagnostic control system and the interactive control system (Bisbe and Otley, 2004).

### 4.2.2 Legitimacy Theory

According to Baba (2004), the legitimacy theory is a system-oriented theory. This theory suggests that firms limit their operations to function within systems and standards which were set by their own society. If the systems and standards change, firms should adapt to the changes in order for them to be parallel with the society's own value systems (Brown and Deegan, 1996).

Nasi et al. (1997) stated that the legitimacy theory interpreted how and why firms deal with issues concerning the environment. On the other hand, Taylor et al. (2001) argue that, under the legitimacy theory, the aim of the firm is to legitimise its behaviour by managing the perception of its stakeholders towards environmental issues. According to Jaafar (2001), environmental reporting is one of the methods of legitimising the firms' operation where firms which have lower or bad environmental performance will find it difficult to operate within society.

The theory actually focuses on the perception of society or other stakeholders towards environmental issues where Patten (1992) and Gamble et al. (1996) support the theory in terms of environmental reporting. However, legitimacy theory does not focus on internal management (such as the information needed by the manager), the theory is focused on how to deal with the environmental issues in order to legitimise firms' activities to outside societies or stakeholders.



Based on above discussion, this study argues that the legitimacy theory is not suitable to explain the role played by management control systems on the relationship between environmental management practice and environmental performance because this theory focuses more on legitimising firms' environmental activities to their stakeholders and societies.

### **4.2.3 Stakeholder Theory**

Sometimes, people in companies, even though they are concerned about the environmental issues, do not take immediate action until there is pressure from outside of the companies, such as stakeholders. According to stakeholder theory, each firm will carry out its activities in order to satisfy the needs of its main stakeholders such as creditors or shareholders. In other words, stakeholder theory recognises the need to be responsive to the demands of members of the public who will be affected by the organisation's actions (Hess, 1999).

Many recent studies have carried out research regarding the issue of stakeholders influencing environmental strategy, such as Wong and Fryxell (2004), Gago and Antolin (2004) and Wehrmeyer et al. (2002). Wong and Fryxell (2004) studied the relationship between stakeholder influences and the effectiveness of environmental management practices of vehicle fleet operations in the Hong Kong transportation sector. They found that stakeholders (regulatory, organization, community and media) influence environmental management practices but to a modest degree (between lowest and highest range), especially from community and media pressure. They classified stakeholder pressures based on Henriques and Sadosky's (1999) four

stakeholder groups which are regulatory stakeholder, organization stakeholder, community stakeholder and media stakeholder.

On the other hand, Gago and Antolin (2004) studied the attributes of stakeholders in influencing the environmental salience (most important issues within corporate social action from the management point of view) of manufacturing firm in Spain and found that Government interventions were one of the greatest powers to influence the environmental action. While Wehrmeyer et al. (2002) in their comparative study in Britain and Germany also examined how firms in the two countries managed their environmental issues and what influences them to consider the issues. They found that the national legislation, firms' own management and regulatory agencies have a considerable influence on firms' environmental strategies for both countries. However, both of these studies were based on firms that are known as polluting industries such as manufacturing firms.

Delmas and Toffel in their recent study in 2005, use another category in order to define stakeholder pressure on environmental management practices adoption. They categorise stakeholders based on non-market and market pressure. They believed that these categories influence directly the environmental practice at plant and parent level of the firms.

On the other hand, Sharma and Henriques (2005) define stakeholders according to their involvement, those who involved with withholding of material such as social and ecological stakeholders and who are directly involved with the use of materials such as economic stakeholders. Whilst, a prior study by Madsen and Ulhoi (2001)

proposed that stakeholder pressure should be categorised according to pressure they exert and whether it is direct pressure, indirect pressure or limited pressure. However, all the above studies also focus on the manufacturing industry.

Although there is not much literature in this field, recently, there have been several studies looking on the issues of stakeholder in the hotel industry. According to Carmona-Moreno et al. (2004), stakeholder pressure is a key determinant in influencing hotel's environmental management practice. Gil et al. (2001) and Carmona-Moreno et al. (2004) identified hotels' most relevant environmental stakeholders are shareholders, governments, travel agencies and tour operators, chain or hotel associations, customers, competitors, employees, NGOs and suppliers. Marquet-Pondeville (2001) stated that pressure from these stakeholders will be a constitutive factor of the hotel's ecological environment. Hotel stakeholders may have different influence on environmental management practices adoption and the level of pressure such as identifying the employees needs regarding environmental training and awareness programmes.

Even though, the stakeholder is important to motivate firms to practise environmental management activities, the primary objective of this study is not to examine the motivation or determinant factors bringing about environmental management practices. What this study is mainly interested in is the effect the management control system has on the relationship between environmental management practice and environmental performance, above and beyond the effect of environmental management practice on environmental performance. Therefore, this study argues that stakeholder theory is not particular relevant to be used in this study to explain the

role played by the management control system in the environmental management perspective.

#### **4.2.4 Summary of the Theoretical Framework**

As discussed in the previous section, since this study examines the relationship between environmental management practices or strategy and management control systems, the relationship could be better explained using the contingency theory. To summarise, this study argues that if the hotels' environmental performance improves, the result may be contingent upon environmental management practice or the use of management control systems or other contingency variables such as size, structure and chain affiliation or on a combination of these factors.

Previous studies, such as Langfield-Smith (1997) and Simons (1987; 1990; 1995), which examine the link between management control systems and strategy have also used the contingency approach. They suggested that the management control system should link explicitly to support the strategy of the business if it is to lead to a competitive advantage and superior performance. On the other hand, Bisbe and Otley (2004) used the framework to test the role played by management control systems in the relationship between strategy and performance. However, they used product innovation as a proxy of strategy and did not examine in the environmental management perspective.

In conclusion, the current study which adapts a framework of Simons (1990, 1991, 1995), Anthony and Govindarajan (2001) and Bisbe and Otley (2004) has three different views from the original framework.

First, even though the current study adapts Anthony and Govindarajan's (2001) framework; the study adds a new element to suit the nature and objectives of the study. The new elements which were related and vital to environmental management practices are top management commitment and budgeting control. Top management commitment was discussed in Simons's (1990; 1991; 1995) control system typology under interactive control systems.

Secondly, this study uses a different view to Anthony and Govindarajan (2001) where, in Anthony and Govindarajan's study, they mentioned firm structure, firm culture and human resources as isolated and contingency elements from or to management control system which may interact with each other. This study, conversely, takes the view that all the elements, apart from firm structure, may form the management control systems and interact with each other within the management control system framework (Gordon and Narayanan, 1984; Chapman, 1997).

However, after running the correlation analysis, there was a high coefficient correlation (more than 0.8) between human resources (personnel involvement) and top management. Thus, this result confirms the existence of a multicollinearity problem<sup>27</sup> in the model for the study. Therefore, as suggested by Pallant (2004), this problem will be solved by combining these two variables (personnel involvement and top management) as one variable and this study names the new variable as an interactive control system. In addition, firm structure was also considered as a factor

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<sup>27</sup> The concept of multicollinearity problems is discussed in subsection 6.5.1.3.

that influences management control systems and is not an integral part of the management control system, as suggested by Gordon and Narayanan (1984).

Third, in order to test the role played by management control systems, Bisbe and Otley's (2004) framework is adapted. However, the framework in the current study is discussed within environmental management literature. In each management control system element, the issues of environmental management are being discussed. The current study also puts the eco-tool such as environmental auditing and reporting<sup>28</sup> as management control elements to collect the necessary information for management to control the environmental management strategy. This type of eco-tool is called the environmental information system. Therefore, the current study adds to the body of knowledge in both fields of literatures; management control system and environmental management.

Lastly, since the framework of contingency variables is discussed in the context of a service-based industry (namely the hotel sector), the size (number of rooms) and chain affiliation are also included in the framework as a control variable.

### **4.3 Conceptual Model and Hypotheses**

The schematic diagram showing the relationship between environmental management practice, environmental management control systems and environmental performance is portrayed in Figure 4.2, 4.3 and 4.4. According to Sekaran (2000), a research model is the theoretical framework that conceptualises how one theorizes the relationships between the several factors that have been identified as important to the

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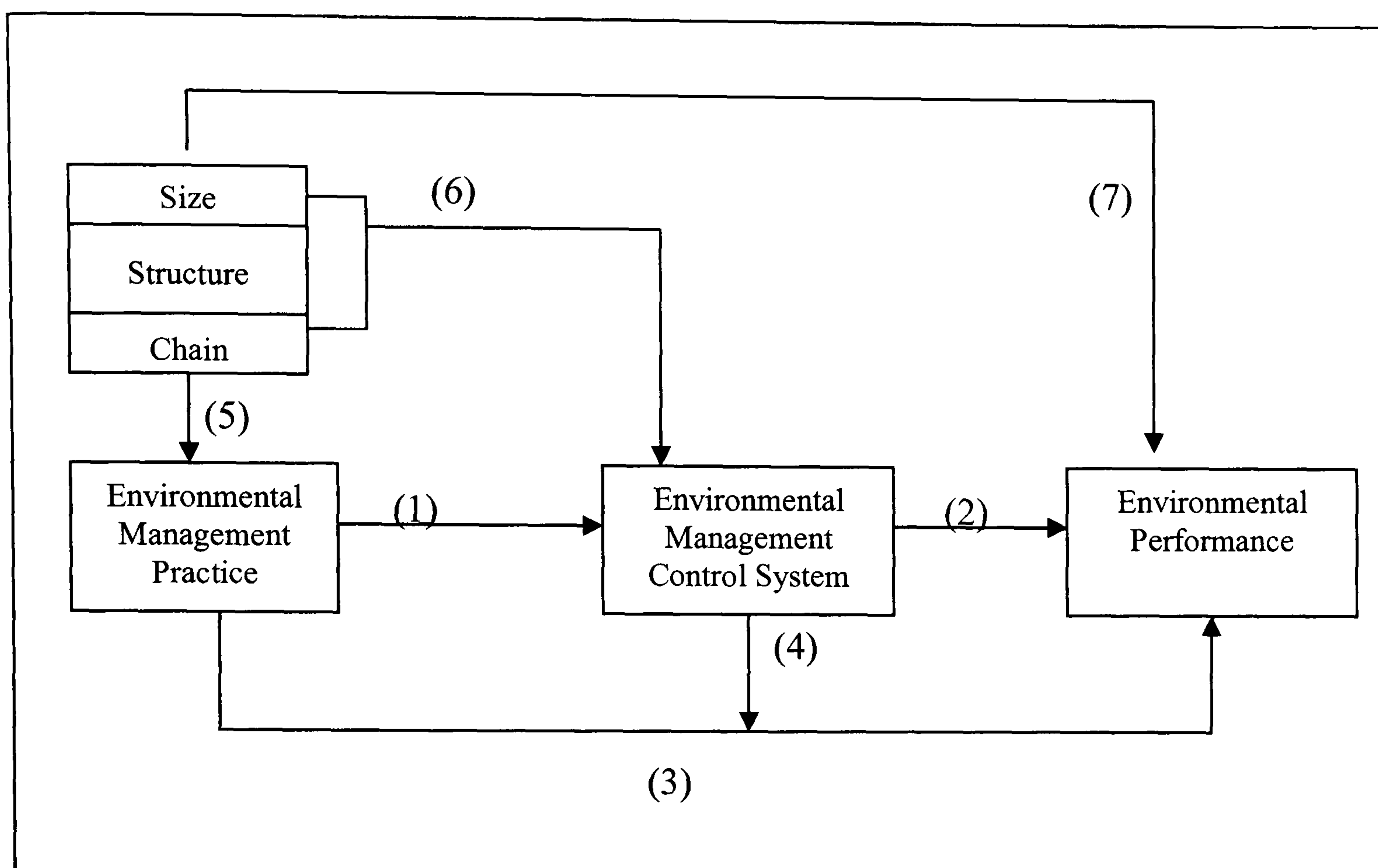
<sup>28</sup> In the U.S.A, environmental auditing is understood as being a check of compliance with regulations, whereas in Europe, it is classified as a management control system (Schaltegger et al., 2003).

problems. The relationship between variables could be explained by the contingency theory.

The framework is adapted from Simons' (1990, 1991, 1995) and Anthony and Govindarajan's (2001) management control framework and has some similarities with the framework presented by Bisbe and Otley (2004) on the effects of the interactive use of management control systems on product innovation. However, instead of looking at the product differentiation strategy (product innovation), the current study focuses on environmental management strategy (or practice) and the links with management control system and environmental performance.

In addition, according to Sharma (2002), the previous contingency researchers, such as Thompson (1967) did not focus on the service sector, and the discussions on contingency variables (such as strategy) did not differentiate between service and non-service firms. Therefore, this study holds the assumption of the contingency view that the type of industry should not be an influential factor in the relationship and this study seeks to investigate whether the relationship between practice, management control systems and performance is also true in a service based sector, such as the hotel sector.

**Figure 4.2:**  
**The Conceptual Model**



The conceptual model above shows the relationship between environmental management practice and the management control system (link 1), management control systems and environmental performance (link 2) and environmental management practice and environmental performance (link 3). The model also shows the indirect effect of environmental management practice on environmental performance acting through the management control system (link 1 + link 2). The moderating effect of management control system on the relationship of environmental management practice and environmental performance is also visualised in the model (link 4). The relationship between the size, structure and chain affiliation and environmental management practice (link 5), management control systems (link 6) and environmental performance (link 7) are also shown by the model.



Hence, in order to examine the implication of the two different types of relationships between environmental management practice, management control systems and environmental performance, this study develops two models, as below:

- (1) The first model aims to test the direct and indirect effects of the environmental management control system respectively on environmental management practice and environmental performance (refer to Figure 4.3: Direct and indirect model)
- (2) The second model aims to test the presence of moderating effects by which the environmental management control system influences the impact of environmental management practice on environmental performance (refer to Figure 4.4: Moderating model).

#### **4.3.1 Direct and Indirect Effect**

Direct and indirect effect is said to exist when the one variable (an antecedent variable) influences a consequence through another variable (an intervening variable).

According to Baron and Kenny (1986), indirect effect is used to explain the mediation effect where the test is purposely to explain how external events take on internal significance.

#### **4.3.1.1 Environmental Management Practice (ENVMGT) and Environmental Management Control System (EMCS) – Hypothesis 1**

As discussed in Chapter Three, environmental management practices<sup>29</sup> represent strategies implemented by firms. The more the firm commits to environmental management practice, the more proactive the firm is (Theyel, 2000; Carmona-Moreno et al., 2004). The contingency theory assumes that a close link exists between firm strategy and control systems. This theory presumes that the type of firm strategy is a factor of the management control system design. In other words, any changes in firm strategy should change the design of the management control system. As Tekavcic et al. (2005) said, strategy is a vital factor in the design and use of management control systems.

Thus, many previous studies (such as Miles and Snow, 1978; Govindarajan & Gupta, 1985; Simons, 1995) have shown that the types of the firms' strategy have a significant relationship with the types of control systems that firms choose (such as information management systems, the budgeting control system, the interactive control system and the cultural control system). Miles and Snow (1978) argue that any strategy choice which the company makes will affect its management control system. For example, if a firm decides to commit to an environmental management strategy, therefore, in order to succeed, a firm should integrate environmental management into management control systems design.

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<sup>29</sup> Practice and strategy will be used interchangeable because in this study, environmental management practice represents the environmental strategy employed in the firm.

In addition, using the contingency view, there is a systematic difference in the management control systems used by a firm in its pursuit of different strategies (Miles and Snow, 1978; Govindarajan and Gupta, 1985 and Simons, 1987). In an earlier study, Miller and Friesen (1982) indicated that the strategy of the firm affects the way a management control system is used in the firm. Simons (1987) in his study also found that management control natures differ between two different strategies where the defender (similar to reactive strategy) uses a control system less intensively and a prospector (similar to proactive strategy) uses a control system more intensively.

Extending this relationship to the environmental management context, Roome (1992) argued that once firms adopts a proactive response to environmental issues, then changes in strategy should be matched by changes in their management control system. Aragon-Correa (1998) found a significant relationship between proactive environmental management practice and natural environmental development relative to other practices in the manufacturing sector. As Jansson et al. (2000) suggest the integration of an environmental management system (as one of the parts of environmental management strategy) with other control systems has a positive effect on a firm.

Therefore, based on the above discussion, this study assumes that environmental management practices have positive and direct influence on environmental management control system and examines whether this relationship is also true in the hotel sector. According to Brown (1996), the hotels sector is not yet taking a proactive approach to environmental concerns. Therefore, study on the relationship

between environmental management practice and the extensive use of environmental management control system in Malaysian hotel sector is needed.

Accordingly, the following hypothesis is proposed:

H1: *There is a positive and direct relationship between environmental management practice (ENVMGT) and environmental management control systems (EMCS) in the Malaysian hotel sector.*

Based on Simons' (1995) work, interactive control systems may motivate firms to search for new initiatives and trigger people in firms to look for a new strategy in order to improve performance. According to Bisbe and Otley (2004), an interactive control system is a system where top management are personally involved interactively in any decision making. Ahmed et al. (2003) also suggest that top management commitment is a key element of environmental initiatives. This study argues that if firms adopt environmental management practice in their strategy, in order to be successful, top management and employees should change to adopt a new strategy approach (i.e. an environmental strategy). So, the current study argues that if hotel sector includes concerns on environmental issues in their strategy, top management and employees control systems (Interactive control system) should also be designed to follow the strategy implemented.

The hospitality literature, such as Ferguson and Berger (1986) stresses that budget is an important mechanism for planning and controlling. Their study argues that budgetary and other control systems found in service firms would be contingent on their strategy. Their premise was based on the Fitzgerald et al. (1991) study which

found that budgets form an integral component of management control systems in the hotel sector where budgets quantify the strategic plans of hotels by translating them (the plans) into day-to-day operation.

Environmental audit and reporting is also one of the environmental information systems that can guide firms to manage and control their environmental management strategy. These information systems are essential if a firm is serious about improving its environmental performance. As mentioned by Baines and Langfield-Smith (2003), appropriate accounting information supports effective resource management and contributes to environmental performance. Environmental audit and reporting, as mentioned by Welford (1996) can be used as an indicator to collect such information in order to make such decisions. According to Simons (1995), this information can be used by managers to search for opportunities, to communicate plans and goals, to monitor the achievement of plans and goals and to keep people (in the firm) informed of any development of a new strategy (such as an environmental strategy).

In the environmental management literature, it is believed that if the environmental audit and reporting system is good, the information which is used to maintain and alter patterns in firms' activities will also be sufficient to control environmental impacts. As Schaltegger et al (2003) stated, environmental monitoring through auditing or verification provides a basis for enforcing environmental legislation and maintaining the actions taken that continuously improve environmental protection.

According to Hunt and Auster (1990), the culture privilege (such as a reward system for employees who perform well in solving environmental problems or incentive systems for those who participate actively in environmental management practice) will be designed to increase employees' willingness to initiate environmental improvement. Previously, firm culture was seen as a distinct factor which influenced budgets (Dunk and Lyson, 1997; O'Connor, 1995) or it was said to be a related factor to accounting and reporting practices (Chow et al., 2002).

The current study assumes that, apart from the above mentioned factors (budget and accounting practices), firm culture is also related to education, training and an awareness program of sharing the knowledge and belief and at the same time developing a new culture in the firm. Therefore, according to contingency theory, firm culture must change in order to adopt a new perspective within a firm.

In other words, this study argues that all environmental management control systems, (interactive control system, environmental budgeting control system, environmental information system and cultural control system) are contingent upon environmental management practice.

Accordingly, it is hypothesised that:

*There is a positive and direct relationship between environmental management practice (ENVMGT) and:*

H1a: *extensive use of interactive control system (INTERACTIVE) in the Malaysian hotel sector*

H1b: *extensive use of environmental budgeting control system (BUDGET) in the Malaysian hotel sector.*

H1c: *extensive use of environmental information system (EIS) in the Malaysian hotel sector.*

H1d: *extensive use of cultural control system (CULTURE) in the Malaysian hotel sector.*

#### **4.3.1.2 Environmental Management Control System (EMCS) and Environmental Performance (ENVPERF) – Hypothesis 2**

A recent study, Henri and Journeault (2006) on the relationship between management control system elements and environmental performance in manufacturing firms found that management control systems positively influence environmental performance. Hertin et al. (2004) also proposed that even though firms follow the environmental management standard (i.e. EMAS) in their strategy, an improvement in their environmental performance can only be achieved through the imposition of a specific management control system. Tekavcic et al. (2005), on the other hand, suggests the proposition that the use of more comprehensive management control systems will improve firm performance.

Whilst the relationship between the management control system and the environmental performance has tended previously to focus on manufacturing firms, this study assumes that such relationships may also be applicable to service sectors (i.e. the hotel sector).

Therefore, the following hypothesis is proposed:

H2: *There is a positive and direct relationship between environmental management control system (EMCS) and environmental performance (ENVPERF) in the Malaysian hotel sector.*

Gibson (1990) argues that firms succeed in their business due to commitment by top management and strong leadership. Top management commitment is in fact a performance measurement factor and it is also a critical success factor for environmental management practice. As Jansson et al. (2000) suggest in their study, top management must be engaged in the project, by creating prerequisites for strategic planning and follow-up that also takes environmental issues into account. In addition, Kwai-Sang and Kit-Fai (1999) argue that top management commitment needs to communicate the importance of the environmental management system to employees and to motivate them to participate in environmental work in order to achieve better environmental performance.

Furthermore, Merchant (1997) also argues that the top management and personnel control (interactive control system) allow the firm to ensure that the employees will control themselves in their behaviour or will control each other. Thus training and



education for example are very often mentioned parameters for the success of environmental management practices in the firm. The managers, the employees and the workers have to be trained to correctly plan and implement the environmental management system. Newman and Breeden (1992) pointed out that training programmes will provide the skill required to fulfil assignment responsibilities and to increase environmental awareness and hence, improve environmental performance.

Abernethy and Brownell (1999) also argue that interactive use of budgeting has a positive effect on the firm performance. Even though Bisbe and Otley (2004) suggests the non-significant relationship between the use of budgeting and firm performance, a recent study, Henri and Journeault (2006) on the environmental management perspective argue that budgeting has a positive influence on environmental performance.

Environmental information system is also important to gather information from reports and assist the management teams in controlling and monitoring performance. Simons (1995) argued that senior management used information for various purposes, such as to communicate plans and goals, to monitor the achievement of plans and goals and to keep themselves informed and informs others of emerging developments. Watson and MacKay (2003) also argued that an environmental information system (by using environmental audit and reporting) is one of the tools used to evaluate environmental performance. Baba (2004) also suggests that by using an environmental audit, environmental performance will be improved. Henri and Journeault (2006) suggest that the way in which the firms use the content of this audited information will affect performance. Thus, the more extensive the use of

environmental audit and reporting, the better environmental performance is. This study argues that this proposition may also be applicable to hotel sector.

In terms of environmental management literature, people in firms should share the environmental information that creates value within firms and is able to change belief systems in order to improve environmental performance. Hunt and Auster (1990) argued that firms should implement environmental culture to increase peoples' willingness to initiate environmental improvements. They argued that firm culture has a positive effect on environmental performance.

Accordingly, therefore, it is hypothesised that:

*There is a positive and direct relationship between:*

H2a: *extensive use of interactive control systems (INTERACTIVE)*

H2b: *extensive use of environmental budgeting control systems (BUDGET)*

H2c: *extensive use of environmental information systems (EIS)*

H2d: *extensive use of cultural control systems (CULTURE)*

*and environmental performance (ENVPERF) in the Malaysian hotel sector.*

#### **4.3.1.3 Environmental Management Practice (ENVMGT) and Environmental Performance (ENVPERF) – Hypothesis 3**

Environmental management practice is argued to have the potential to control and reduce the costs of normal business operations. Middleton and Hawkins (1993) said that many environmental activities are actually having cost-benefit effects. Similarly, Shrivastava (1996) mentioned that by decreasing the waste charge in the production process, firms will gain improvement in environmental performance. Aboulnaga

(1998) and Lawrence et al. (1998) also claimed that environmental management practices will help firms reassess their environmental performance, thus leading to higher productivity and innovation. Carmona-Moreno et al. (2004) suggest that there is a relationship between environmental management practice and environmental performance. The hotels with a low level of commitment to environmental management practice will have no advantage in terms of environmental performance.

From a different perspective, it is also claimed that there is an association between environmental management practice and financial performance. Theyel (2000) and Montabon et al. (2002) also claimed that there is a positive association between proactive environmental strategies and performance where adopting environmental practice leads to improved financial performance. Benito and Benito (2005) proposed that environmental proactivity can have a positive effect on business performance. However, they argued that the effect depends on the level of environmental proactivity.

To sum up, the review of the literature reveals that the adoption of environmental management practice will lead to improvement in performance. On the other hand, this relationship was examined in manufacturing firms, and not in the service sector. Furthermore, most of the literature examines the relationship in financial performance, in general. However, as mentioned by Thompson (1967), the discussion on contingency variables such as environmental management practice do not differentiate between service and non-service industry, therefore, this study argues that the framework of the relationship between environmental management practice and environmental performance can also be applied to the service sector, namely the

hotel sector. Both of the industries are generally assumed to follow the same trend in regards of the relationship between environmental management practice and environmental performance.

In short, this argument can be formally expressed as:

H3: *There is a positive and direct relationship between environmental management practice (ENVMGT) and environmental performance (ENVPERF) in the Malaysian hotel sector.*

Figure 4.3 also posits the indirect effect of environmental management practice (ENVMGT) on environmental performance (ENVPERF) acting through environmental management control system (EMCS).

#### **4.3.1.4 Indirect Effect of Environmental Management Practice (ENVMGT) on Environmental Performance (ENVPERF) acting through Environmental Management Control System (EMCS) – Hypothesis 4**

Management control literature has long considered practice or strategy to be one of the contingent factors of management control systems in order to improve performance (Govindarajan and Gupta, 1985; Simons, 1987; 1990; and 1995; Langfield-Smith, 1997). It also suggests that there is an important link between strategy and management control systems and that a 'fit' between these two variables leads to a better performance.

There is also an argument that management control systems should be designed and used to support a firm's strategy and thus lead to superior performance (for examples,

Govindarajan and Gupta, 1985; Simons, 1987; 1990) and it is also argued that better performance may result from the matching of strategy and control systems.

In the environmental management literature, Brown (1996) argued that when hotels adopt a proactive response to environmental issues, their strategy should change and the changes should be matched to changes in their management control system, thus leading to better hotels' performance. Whereas, Henri and Journeault (2006) who examine the influence of management control systems on environmental performance in small-medium manufacturing industries also suggest that eco-control systems positively influence environmental performance.

All these empirical literatures provide evidence that there is a contribution made by strategy towards a better performance, in general. However, even though Brown (1996) and Henri and Journeault (2006) studied the effect of management control systems on the environmental management perspective, they did not discriminate what role the management control system plays in the relationship.

Based on the previous literature but from the environmental management perspective, this study will investigate whether the extensive use of environmental management control systems can be linked to environmental practice or strategy commitment thus linked to environmental performance. Alongside, the commitment of environmental management practice can be expected to have implications for environmental performance through the extensive use of environmental management control systems. This link is also expected to be true in the hotel sector. Thus, based on the premise of the contingency theory, the proposed hypothesis is highlighted:

H4: *There is a positive indirect relationship between environmental management practice (ENVMGT) and environmental performance (ENVPERF) through extensive use of environmental management control system (EMCS) or*

- *H4a interactive control system (INTERACTIVE) or*
  - *H4b environmental budgeting control system (BUDGET) or*
  - *H4c environmental information system (EIS) or*
  - *H4d Cultural control system (CULTURE)*
- in the Malaysian hotel sector.*

In conclusion, Figure 4.3 presents the direct effect between

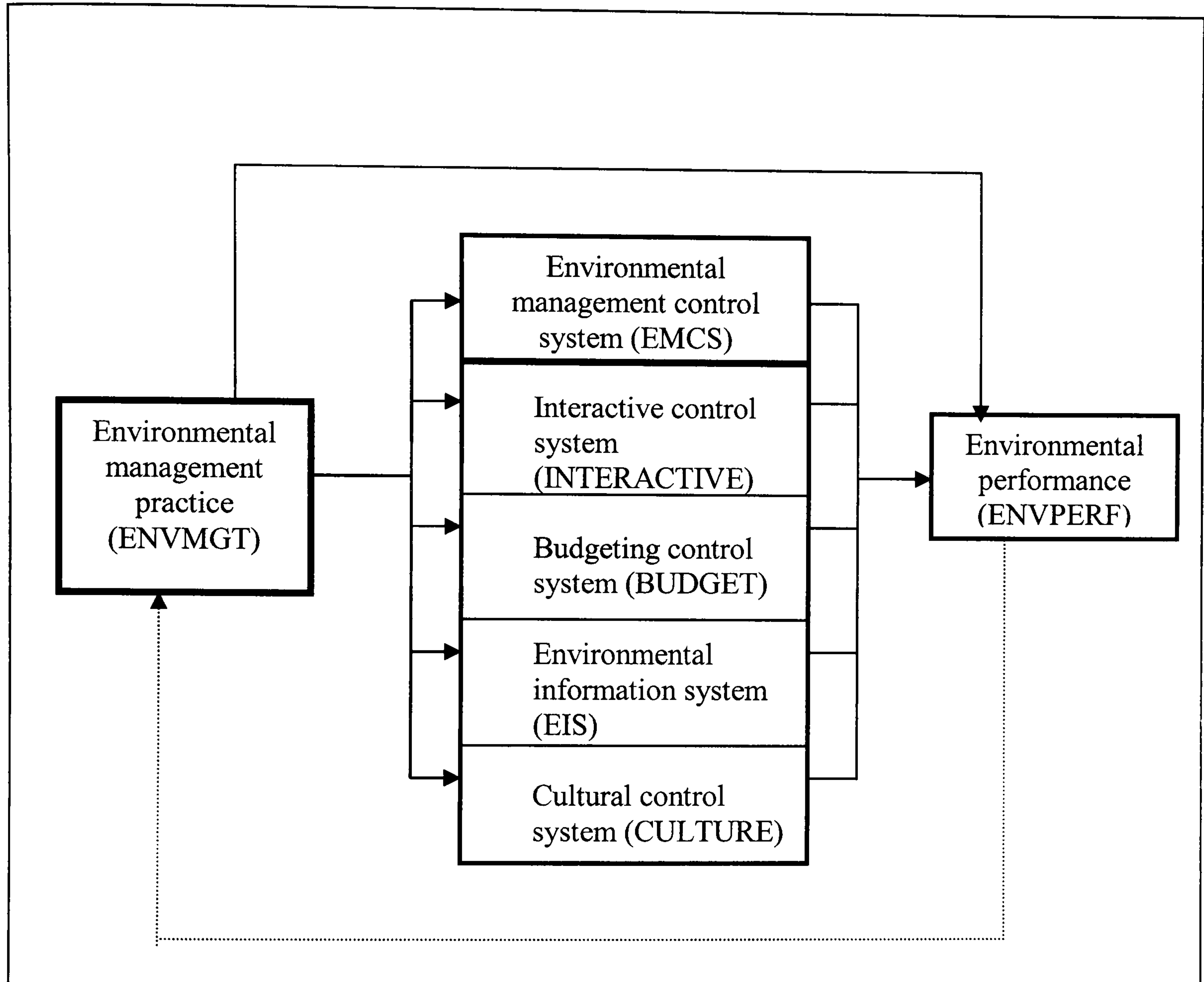
(1) Environmental management practice (ENVMGT) and environmental management control system (EMCS),

(2) Environmental management control system (EMCS) and environmental performance (ENVPERF),

(3) Environmental management practice (ENVMGT) and environmental performance (ENVPERF) and,

(4) Indirect effect of environmental management practice (ENVMGT) on environmental performance (ENVPERF) through the use of environmental management control system (EMCS)

**Figure 4.3:**  
**The Direct and Indirect Effects Model (Adapted From Anthony and Govindarajan’s (2001) and Bisbe and Otley’s (2004) Conceptual Framework).**



Note: Dotted line is a feedback loop where if the environmental performance is not improved, then hotels should go back to revise their practice or strategy. However, this feedback loop is beyond the scope of the study.

### **4.3.2 Moderator Effect**

According to Baron and Kenny (1986), a moderator effect exists when connections between two variables (for example; environmental management practice and environmental performance) is affected by a third variable (management control system) (refer to Figure 4.4). Kim et al. (2001) suggested that a moderator will reduce or enhance the direction of the relationship between a predictor (environmental management practice) and dependent variable (environmental performance)

#### **4.3.2.1 The Moderating Effect of Environmental Management Control System (EMCS) on the Relationship between Environmental Management Practice (ENVMGT) or and Environmental Performance (ENVPERF) – Hypothesis 5**

According to Bisbe and Otley (2004), contingency theory asserts that the impact of strategy on performance is influenced by attributes of structural arrangement (for example, management control systems). Bisbe and Otley (2004), adapted Simons's (1995) framework and found that the impact of innovation strategy on performance is moderated by the use of management control systems.

In environmental management literature, adapted from Bisbe and Otley's (2004) work, the relationship between the level of environmental management practice and environmental performance can then be expected to be enhanced when firms use environmental management control system. Schaltegger et al. (2003) suggested that the integration of environmental management tools such as environmental accounting



and auditing will improve the relationship between environmental management practice and environmental performance.

Overall, theoretical development suggests that the nature of the relationship between environmental management practice and environmental performance is diversified and varied. The variety depends on the extent firms implement or extensively use management control systems in the environmental management context.

Therefore, by advancing the above argument to the service based sector, the following research hypothesis is proposed to test the prediction of this moderating effect:

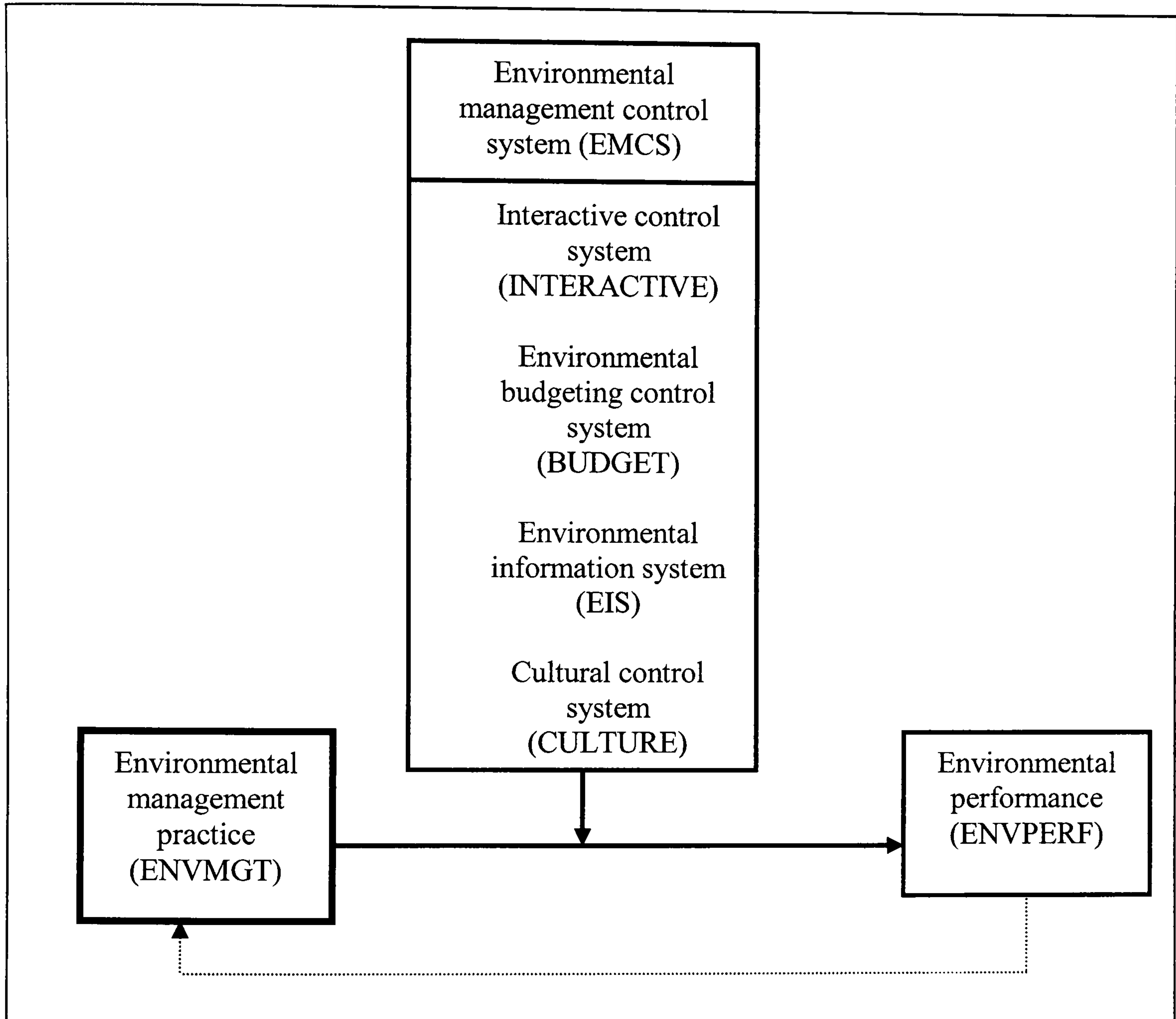
H5: *The more extensive the use of:*

- *Environmental management control system (EMCS) or*
- *Interactive control system (INTERACTIVE) or*
- *Environmental budgeting system (BUDGET) or*
- *Environmental information system (EIS) or*
- *Cultural control system (CULTURE*

*the greater the effect of environmental management practice (ENVMGT) on environmental performance (ENVPERF) in the Malaysian hotel sector.*

Figure 4.4:

The Moderating Effects Model (adapted from Anthony and Govindarajan’s (2001) and Bisbe and Otley’s (2004) Conceptual Framework).



Note: Dotted line is a feedback loop where if the environmental performance is not improved, then hotels should go back to revise their practice or strategy. However, this feedback loop is beyond the scope of the study.

### **4.3.3 Size (SIZE), Environmental Management Practice (ENVMGT), Environmental Management Control System (EMCS) and Environmental Performance (ENVPERF) – Hypothesis 6**

The design of the control system component could be directly affected by the size of the firm. As discussed in Chapter Three, there is a relationship between firm size and the control system of the firm. Merchant (1981) discussed the relationship between size and the management control system and found that in larger firms, an administrative approach to management control can be linked to better performance, while in smaller companies, a personal control system is likely to be more effective. Merchant (1981) argued that larger firms used formal control devices such as budget to assist effective planning and control of activities. Sharma (2000) mentioned that a small firm's activities depend on direct supervision and oral communication.

In environmental management literature, LaFontaine (1998) also pointed out that firm size has a positive link with the presence of environmental information in the annual reports, which increases the communication level and thus, leads to better environmental performance. LaFontaine (1998) argued that larger firms influence the disclosure of information in the firm's annual report, but small firms neglect to disclose their firm's information.

Based on the argument by Merchant (1981) and LaFontaine (1998), the current study will assume that larger hotels have more capital and resources

- to motivate managers to be extensively involved in decision making (interactive control system),

- to put effort into budgeting system (budgeting),
- to disclose environmental information in reports (accounting information system) and
- to change the employees' behaviour towards strategy and objective (culture).

This study also argues that all these points could be applied to the environmental management. Therefore, the following hypothesis is proposed:

*H6a: The larger the hotel size, the more extensive the use of the environmental management control system (interactive control system, environmental budgeting system, environmental information system and environmental culture).*

In environmental literature, Spicer (1978) suggested firm size as a factor influencing pollution control where larger firms have a better record compared to smaller firms. According to Henriques and Sadorsky (1995; 1999), Aragon-Correa (1998) and Theyel (2000), there is a positive relationship between size and environmental management practices. For example, Henriques and Sadorsky (1995) found that small firms generally have been found to be more reactive and larger firms were more proactive on environmental issues. This result may be similar to the studies by Trotman and Bradley (1981) and Levy (1995) which suggested that larger companies tend to be more proactive by disclosing more information on environmental policies and programmes. However, their findings were contradicted by Stanwick and Stanwick's (1998) study which showed that firms which are more environmentally responsive tend to be smaller in size.

Other studies, for examples, Chen and MacMillan (1992) and Kumar and Siddharthan (1994) have also found that a relationship exists between a firm's size and firm performance. However, their study focused on firm performance in general and not specifically on environmental performance. Baylis et al. (1998) found that large firms are more aware than small-medium firms of their environmental obligations and environmental pressure. Moreover, based on studies by Sharma and Vredenburg (1998), Gil et al. (2001) and Carmona-Moreno et al. (2004), larger firms will have more resources to invest in environmental protection and prevention. According to Merrit (1998) and Gil et al. (2001), large firms also might have a formal procedure in order to practise environmental management.

For all these reasons, large firms can be expected to have greater motivation to adopt environmental strategies in a more proactive manner than small firms. In the light of existing findings of the research concerning the relationship between firm size, environmental management practices and environmental performance, the following hypotheses is advanced in the hotel sector as:

*H6b: The larger the hotel size, the higher the commitment the hotel has to practise environmental management activities.*

*H6c: The larger the hotel size, the better environmental performance.*

#### **4.3.4 Structure (STRUCTURE), Environmental Management Practice (ENVMGT), Environmental Management Control System (EMCS) and Environmental Performance (ENVPERF) – Hypothesis 7**

As discussed in Chapter Two, firms need a structure to support and implement an environmental strategy. Firm structure is required for implementing an environmental structure such as the setting up of an environmental department, formal and informal compliance mechanisms, a structure of responsibility and tasks assigned to particular divisions and levels, auditing procedures and the certification of management systems.

Some larger firms have established separate departments to operate and manage environmental issues. As Berry and Rondinelly (1998) state, firms who apply environmental proactive strategies tend to follow a decentralised approach to environmental management. A separate department to monitor environmental issues will assist managers in implementing environmental programmes and thus will lead to a better environmental performance.

There is an argument that a firm with a proactive strategy will start to decentralise the environmental structure because corporate 'guidance' is no longer needed as environmental issues become incorporated into daily practice. As Hoffman (2000; p 165) said 'environmental managers are destined eventually to work themselves out of a job'.

However, considering the complex nature of the firm structure, Barlett and Ghosal (1989, 1998) had alternative views. They noted that in the global firms, no single firm structure can deal with the complex nature of the firms. This means that in order to support complex firm activities, the firm structure should be arranged to suit the nature of the firm.

As mentioned in the previous discussion (Subsection 3.4.2), for firms to become proactive and give a higher level of commitment, firms should follow a decentralised and organic approach (Byrne and Kavanagh, 1996; Berry and Rondinelli, 1998). Therefore, consequently, the following hypothesis is proposed:

*H7a: There is a positive relationship between the decentralisation and organic-type of hotel environmental structure and the commitment to the environmental management practice.*

According to Sharma (2002), the decentralised firms will make greater use of budgeting systems for communication, control and performance evaluation. As firms become larger and more diverse, the informal control system becomes less effective. Previous studies, such as Otley (1978) and Hopwood (1972) also argued that the more decentralised the firm, the more effective the management control system. Therefore, it is hypothesised that:

H7b: *There is a positive relationship between decentralisation and the organic-type of the hotel environmental structure and the extensive use of management control systems (interactive control system, environmental budgeting system, environmental information system and environmental culture).*

According to Mauser (2001), however, with regard to the environmental structure, the literature does not indicate a clear relationship between a centralisation of firm structure and environmental performance. The expectation about the relationship between environmental firm structure and environmental management practice or strategy is based on the premise that the level of the environmental firm structure whether centralised or decentralised, mechanistic or organic is positively related to the improvement in environmental performance. Therefore, it is postulated that:

H7c: *There is a positive relationship between the decentralisation and organic-type of the hotel environmental structure and environmental performance*

#### **4.3.5 Chain Affiliation (CHAIN), Environmental Management Practice (ENVMGT), Environmental Management Control System (EMCS) and Environmental Performance (ENVPERF) – Hypothesis 8**

According to Carmona-Moreno et al., (2004), chain affiliation is not a factor in distinguishing between firms who apply environmental management and those who do not. Some researchers such as Darr et al. (1995), Ingram and Baum (1997) and



Brown and Dew (1999), who studied the benefit of chain affiliation in the hotel sector, however, found that transferable and changeable skills and knowledge between components will lead to an increase in the efficient use of resources and will promote an extensive adoption of environmental management practices among the chain.

A study carried out by Gil et al. (2001) stated activities which are implemented by chain affiliation are vital as transferable knowledge to implement environmental management activities more efficiently. In hotel management literature, it is said that the hotels affiliated to a hotel chain practise more extensive environmental management than those who are non-affiliated. Thus, the following hypothesis is proposed:

*H8a: There is a positive relationship between a hotel's chain affiliation and its environmental management practices*

Blair and Hitchcock (2001) mentioned that firms which have long distance industry-based association or chain affiliation will have less significant influence to monitor the firms' activity. However, chain-affiliated firm will have greater influence on the use of management control system through their support by conducting environmental training and awareness programmes (Carmona-Moreno et al., 2004). Therefore:

*H8b: There is a positive relationship between a hotel's chain affiliation and its environmental management control system*

Carmona-Moreno et al. (2004) also mentioned that the chain provides the firms with information regarding the ecological market and this can lead them to monitor the operation in order to compete more effectively with their competitors. According to them, chain's decision making will lead to better environmental performance.

*H8c: There is a positive relationship between a hotel's chain affiliation and its environmental performance*

#### **4.4 Chapter Summary**

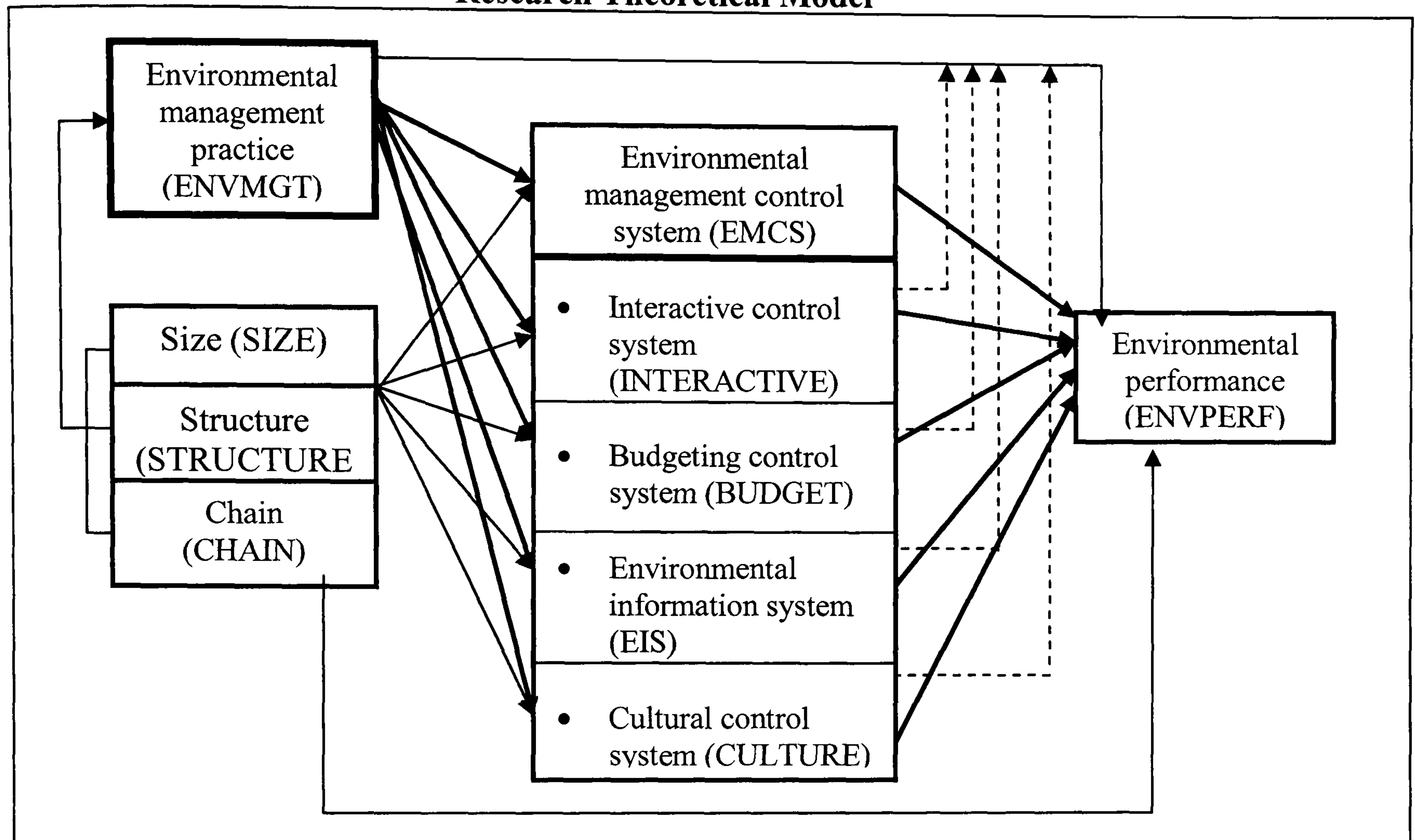
This chapter has provided a discussion of the theories used in the current study and has discussed the development of hypotheses and propositions. This chapter also introduces contingency theory in order to apply it in the study.

This study uses two models in order to examine the influence of management control systems on the relationship between environmental management practice and environmental performance. Figure 4.3 and Figure 4.4 portray the direct and indirect effect and the moderating effect. The management control system is examined in the perspective of environmental management and comprises four elements as a proxy to environmental management control systems, namely interactive control system, environmental budgeting system, environmental information system and cultural control system. It should be noted that the feedback effect (for example, if the environmental performance does not improve, the corrective action should be put forward at the stage of planning or monitoring and controlling) is beyond the context

of the study. In the following chapter, the methodology used in the current study is discussed. Figure 4.5 below summarises the research model used in this study.

Figure 4.5

## Research Theoretical Model



- Main effect<sup>30</sup>  
 - - - Indirect effect<sup>31</sup>  
 ····· Moderating effect<sup>32</sup>

<sup>30</sup> Main effect is a direct effect between environmental management practice (ENVMGT) and environmental management control system (EMCS) and each of control elements (INTERACTIVE, BUDGET, EIS and CULTURE); between environmental management control system and each of its elements (INTERACTIVE, BUDGET, EIS and CULTURE) on environmental performance (ENVPERF); between environmental management practice (ENVMGT) and environmental performance (ENVPERF); between size, structure and chain affiliation on environmental management practice and environmental management control and each of its elements.

<sup>31</sup> Indirect effect is an effect of environmental management practice (ENVMGT) on environmental performance (ENVPERF) acting through the extensive use of environmental management control system (EMCS) or each of its elements (INTERACTIVE, BUDGET, EIS and CULTURE).

<sup>32</sup> Moderating effect is an effect of environmental management practice (ENVMGT) on environmental performance (ENVPERF) is moderated by environmental management control system (EMCS) or each of its elements (INTERACTIVE, BUDGET, EIS and CULTURE).

## **Methodology**

### **5.1 Introduction**

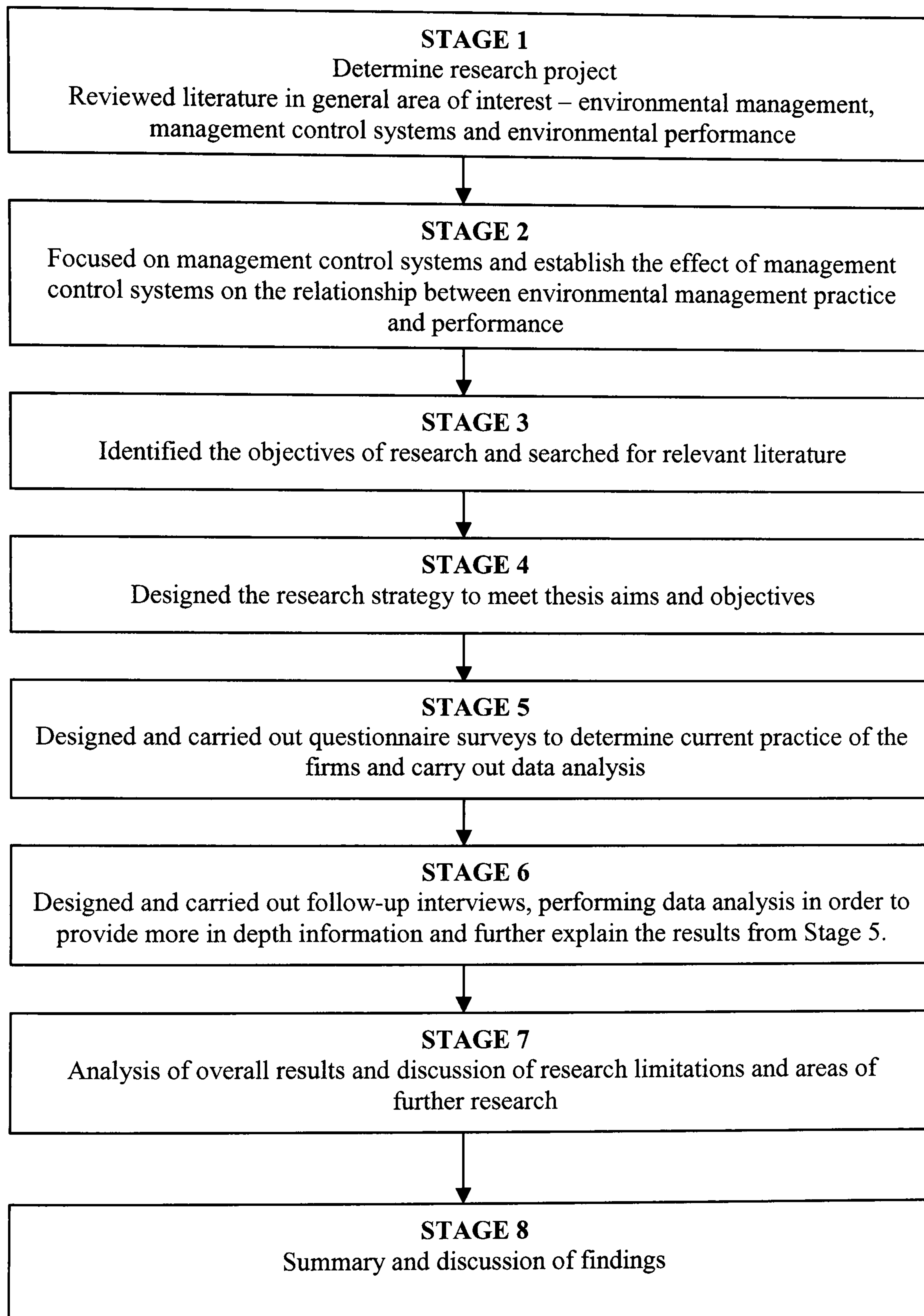
This chapter describes the methodology developed to investigate the influence of (the extensive use) the environmental management control system (EMCS) on the relationship between environmental management practice and environmental performance.

Section 5.2 focuses on data collection, including a discussion of the research strategy, the sampling frame, the questionnaire and the measurement of analysis. Section 5.3 is a description of the methods used for data analysis. The variables and measurements are described in Section 5.4. Section 5.5 summarizes the chapter.

### **5.2 Method of Data Collection**

The overall methodology for the research project is illustrated in Figure 5.1. This shows the life cycle of the project from the initial project inception through to the finished research report. The following discussion highlights the main methodological areas.

**Figure 5.1:**  
**The Stages of the Research**



Refer to previous chapter; the study is to empirically examine the role played by the environmental management control system on environmental performance. The environmental management control system is adapted from the original concept of management control system used by internal management to make decision making, such as investment decision making. Wolk et al. (1992) suggested that two approaches have widely been used by researchers to examine the decision making practice; the market-based approach and the behavioural-based approach<sup>33</sup>.

As mentioned before, the objective of the study is to examine the role played by the environmental management control system in the relationship between practice and performance, thus, the behavioural-based approach is deemed the suitable approach to be used. Zickmund (1991) suggested that there are four methods which can be used by researchers to collecting the data in order to achieve the research objectives; survey, observation, experiment and secondary data. A combination of the methods (two or more) is called multiple or mixed method approach.

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<sup>33</sup> According to Wolk et al. (1992), research which applied the market-based approach examines how practice will influence share price in the market and research which used the behavioural-based approach, on the other hand, focuses on how managers will use the practice in order to make decisions and to achieve their objectives.

In order to achieve the objectives described in Chapter One, the study uses two different data collection methods which are the questionnaire-based survey and the interview-based survey. The study follows a procedure which is called a sequential explanatory mixed method<sup>34</sup> procedure. The rationale for the combination of these two methods is to obtain statistical, quantitative results from the hotel industry regarding the variables (environmental management practice, environmental management control system and environmental performance) and then to follow-up with a few individual hotels to explain those results in more depth.

In the first phase, quantitative research questions or hypotheses will address the relationship between three components; environmental management practices, environmental management control systems and environmental performance in the hotel industry in Malaysia. This phase will examine the influence of the environmental management control system on the relationship between environmental management practice and environmental performance. The aim is to examine whether the environmental management control system plays a direct and indirect effect or moderating roles on the relationship between environmental management practice and environmental performance.

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<sup>34</sup> According to Creswell (2003) and Creswell and Clark (2007), sequential procedures involve the researcher trying to elaborate on or expand the findings of one method with another method. The sequential explanatory strategies begin with a quantitative method in which theories or concepts are tested, and are then followed by a qualitative method involving detailed explanation with a few cases or individual studies.

In the second phase, qualitative interviews will be used to further test the non-significant and significant results (which need a further clarification) from the first phase by exploring and explaining the aspects of the environmental management control system by using a few participants. This subset was obtained from the initial data collection stage of the study, i.e. those who had participated in the questionnaire survey<sup>35</sup>. Hence the individuals in the second phase of data collection are a subset of the participants in the first phase and much smaller than in the first phase. The purpose of the second stage is to explain in depth and further explained the results of the first phase. Furthermore, the interviews were used to explore why the statistical results from the study in Malaysia were not consistent with prior studies outlined in the literature review.

The data collection method will be discussed in more details in the next section.

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<sup>35</sup> The sample selection is discussed in details in 5.3.1. Briefly, the total sample of questionnaire survey is 300 hotels and the respondents were asked about their participation in the interview phase. Twenty respondents mentioned their willingness to participate, but of twenty, only ten was selected as a close and suitable participant for interview stage. The basis of selection is a size of the hotel. Large hotel is frequently stated in the literature as a potential size to implement the environmental management practice (Carmona-Moreno et al., 2004, Gil et al., 2001).



### 5.3 Survey-based Approach

The first phase tests the hypotheses developed in Chapter Four by carrying out a cross-sectional empirical study. A questionnaire was administered to 300 respondents involving Malaysian hotel industries. Mailed questionnaires are mentioned as one of the useful and effective approaches (Baba, 2004; Bennet, 1988, Dane, 1988), easy and cheap (Bennet, 1988) and potentially the least-time consuming technique (Dane, 1988) especially for broad information which covers a geographically dispersed area (Sekaran, 2000) and large numbers of people. Babbie (1990) also mentioned that the questionnaire survey approach has many advantages in terms of ease, economy and response rates; however, disadvantages are still present, such as low response rate and very costly.

As Babbie (1990) points out, questionnaires should be properly planned and pre-tested. In addition, Dane (1988) also mentioned that this type of data collection could involve an excessive amount of time and effort. Also, Sekaran (2000) argued that, with a low response rate, it is difficult to represent the population and any doubts in the questions are not able to easily clarify.

Questionnaires were mailed to 300 hotels with a covering letter assuring anonymity and confidentiality, and a stamped reply envelope. The covering letter explained the purpose of the study. Complete confidentiality for the respondents was guaranteed. The questionnaire was administered in English as English is a well-understood language, particularly in the hospitality business setting, such as the hotel industry which involves a foreign and international clientele.

Therefore, according to Baba (2004), no translation was needed. The actual questionnaire is reproduced in Appendix II.

In order to achieve a high response rate, four steps were adopted (see also Theyel, 2000; Baba, 2004): (i) Pre-notification; (ii) Initial mailing; (iii) First follow-up and (iv) Second follow-up. The first step involved a letter, phone call or e-mail to respondents to promote initial interest of the issues raised. Then, mail was sent to the environmental or hygiene managers in the sample, including the covering letter, questionnaire and business reply envelope. In some circumstances, such as hotels which did not have a full address on the database, the questionnaire was sent by fax or e-mail. The first follow-up was a postcard reminder, while the second was a phone call or replacement questionnaire sent to those who had not answered. The sampling method and the issues of response rate will be discussed later in this chapter.

The initial version of the questionnaire was submitted to a pilot test<sup>36</sup>, between the months of February 2006 and April 2006 and administered to 30 hotels in Malaysia (this pilot sample is excluded from final study). In August 2006, the final questionnaire was mailed to the 300 hotels, after improving the questions so as to eliminate ambiguous questions. The questionnaires were addressed to the hygiene

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<sup>36</sup>. A pilot study is meant to ensure that the questions posed are understood by the respondents. The questions are clearly defined, no ambiguity, and also there are no problems with the wording or measurement before the actual survey was undertaken (Baba, 2004; 164). The sample of the pilot testing is not used for hypothesis testing, but only to check the reliability and validity of the items in the questionnaire. Therefore, 30 hotels in pilot study are chosen using random sampling; include all the numbers of rooms (5 hotels are less than 50 rooms). The Cronbach alpha reliability coefficient for the construct used in the pilot are all more than 0.7, and as Nunally (1978) suggested reliability coefficient of 0.7 or above was considered more than acceptable for most behavioural research application(s).

manager (where the hotel had an environmental or hygiene department) or general manager (where the hotel did not have an environmental department)

In order to test for potential non-response bias, one-way variance (ANOVA) analysis was conducted. The respondents were assessed with an analysis of variance between the early and late respondent groups (Armstrong and Overton, 1977). As Henri (2006) suggested in his study, the late respondents are also used in this study as a proxies for non-respondents. One-way ANOVA was used to see whether there is any significant difference between the two groups in terms of environmental performance (dependent variable). Late respondents are categorised as hotels that replied after the second notification. One-way ANOVA showed no significant differences between the two groups in terms of environmental performance. The non-response bias is therefore not considered a significant issue in this study.

Accordingly, the Chi-Square test shows the Yates' Correction for Continuity has significance level  $>0.05$ . Its value is 0.162 with an associated significance level of 0.687. In order to be significant, the Sig. value needs to be 0.05 or less than that. This means that the proportion of early replies which have high commitment to environmental management practice is not statistically significant difference to the proportion of late replies which have higher commitment to environmental management practice. This result also confirms that the non-response bias is not a significant issue in this study.

### 5.3.1 The Sample Selection

Initially, details of all the 453 hotels in Malaysia were obtained mainly drawn from the *Accommodation guide: Malaysia Truly Asia 2004*<sup>37</sup> (the latest version up to 2007). This database was considered to be a sample of the study (based on Finance Ministry's report, up to 2004, there are in total 2,100 population of hotels in Malaysia). However, after considering the suggestion from the previous literature that environmental management practice and management control systems are most likely to be found in the larger firm, therefore, it was decided to focus on hotels which have more than 50 rooms (A total of 128 hotels have number of rooms less than 50 rooms and 5 of them were included in the pilot sample). As cited previously, according to Bohdanowicz (2003), hotel size is grouped based on a formula, where those below 50 rooms are considered to be a small size hotel, rooms between 50 and 150 is a medium size and over 150 rooms is a large size hotel.

Medium size hotels are also selected for two reasons. Firstly, in Malaysia, most of the hotels can be categorised as a small-medium size enterprises (Baba<sup>38</sup>, 2004) and secondly, analysis can be run to test whether there is any difference in practice between large and medium size hotels. So then, a comparison can also be drawn between these two groups.

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<sup>37</sup> This guide provides hotel addresses, names of the hotels, star ratings, number of rooms and contact numbers (phone, fax and e-mail address). However, the weakness of this guide is that it does not contain the name of a contact person in general and the environmental manager, in particular. Therefore, an initial contact (either by e-mail or by telephone) was made with all the hotels to get the names of the person in charge, especially, of environmental matters or the management control system.

<sup>38</sup> Baba (2004) cited in her thesis that SME in Malaysia can be defined as firms which have between 51 and 150 employees. Her definition is based on criteria given by the Ministry of International Trade and Industry (MITI). Therefore, as hotels have seasonal employees, and the total of permanent employees at one time are normally between the ranges of 50-150, they were categorised as SME enterprises.

After deducting a sample for the pilot study of 30 hotels, the total of 423 hotels can be considered as the sample for the study (refer to Table 5.1). Referring to Roscoe (1975), cited in Sekaran (2000, p296), a sample size larger than 30 and less than 500 is appropriate and the sample size 10 times (or more) the number of variables in multivariate analysis is more preferable. However, out of 423 hotels, 123 hotels have less than 50 rooms (after deducted 5 hotels used in pilot study, so  $128 - 5 = 123$ ). Therefore, because of the limited number of hotels in Malaysia and a tendency for mail questionnaires to have a low response rate, all 300 hotels were chosen as a sample for the study.

**Table 5.1:**  
**Hotels' sample selection**

Total hotels listed in the accommodation guide (exclude budget accommodation)	453
(-) Pilot sample	(30)
Total hotels considered as the sample of the study	423
(-) Hotels less than 50 rooms	(123)
<b>Total hotels used as a sample of the study</b>	<b>300</b>
Mailed questionnaire (m)	300      100%
Returned questionnaire (n)	125      41.7%

Referring to Table 5.1, the returned questionnaire is 125 cases<sup>39</sup> and the response rate of the current study is 41.7 percent. Based on comments by Rahman (2001), this response rate was considered reasonably adequate. Babbie (1990) also mentioned that

<sup>39</sup> After considering the existence of outliers in the model, the number of cases included in the study is 124. In order to detect outliers, the standardised residual was checked. According to Tabachnick and Fidell (1996), if the standardised residual as less than -3.3 or more than +3.3, it means that there is an outlier in the model. Therefore, the procedure to checking which cases the outlier exists, Mahalanobis distance was used. According to Pallant (2004), if number of independent variable is 7, then critical value should be no more than 24.32. The current study only has one case which has a critical value more than 24.32; i.e. case 54.

a 30 percent response rate is an acceptable rate to ensure the result was statistically significant.

The current study's response rate is considered satisfactory when compared to other studies in the area of environmental management and management control systems which was used the same procedure for data collection. For examples, Henri and Journeault (2006) reported a response rate of 20.9 percent after a follow-up mailing, while Baba (2004) had a 30 percent response rate. However, Bisbe and Otley (2004) obtained an effective response rate of approximately 48.33 percent and Sharma (2002) also obtained a 53 percent response rate.

## **5.4 Variables and Measurement**

This section discusses how the variables such as environmental management practices, environmental management control systems and environmental performance are operationalised. This section also discusses how the variables are defined and measured in order to test the hypotheses which were developed in the previous chapter.

### **5.4.1 Dependent Variables**

#### **5.4.1.1 Environmental Performance**

According to Burrit (1997), environmental performance is very useful for environmental reporting. Environmental performance could be operationalised either by using objective indicator (i.e. SO<sub>2</sub> emission, CO<sub>2</sub> emission) or subjective indicator (i.e. improve firms' image and reputation). The indicator will be used to measure the environmental status of the firm by disclosing it in the environmental reporting.

Therefore, by using environmental reporting, environmental performance can be measured.

According to James (1994), measuring a firm's environmental performance is not an easy job as the environmental performance can be measured in many ways (Greeno, 1994) and it is difficult to get the exact figures to prove the environmental performance status (Baba, 2004). In Malaysia, since environmental performance disclosure is still in its infancy (Jaafar, 2001), the way to measure environmental performance by quantitative measurement is rather difficult.

The hypothesis developed in Chapter Four is to investigate whether the effect of environmental performance changes (either enhance or reduce) with the extensive use of environmental management control systems. The hypotheses do not intend to examine the extent environmental performance has increased or decreased. Therefore, this study defines environmental performance based on subjective measurement and does not intend to look at objective figures, such as how much waste is reduced.

There are several authors who use a subjective approach to measure environmental performance, such as Burgos-Jimenez et al. (2002), Carmona-Moreno et al. (2004) and Wagner and Schaltegger (2004). Burgos-Jimenez et al. (2002) suggested that a hotel's environmental performance indicator is concerned with efficiency of the use of resources which reflect the perception of the stakeholders regarding the company's environmental impact. Carmona-Moreno et al., (2004) also measure hotel's environmental performance based on subjective indicators that cover physical factors

(such as efficiency in the use of materials) and societal aspects (such as environmental image and reputation). On the other hand, Wagner and Schaltegger (2004) used index values to measure manufacturing's environmental performance in terms of reductions in environmental impact.

The current study adapts the environmental performance measurement based on Carmona-Moreno et al. (2004) as their measurement was purposely developed and validated to measure hotels' environmental performance. Carmona-Moreno et al. (2004) developed their own measurement of hotels' environmental performance because they had difficulty in finding the measurement from the previous literature. They developed a measurement scale that adequately covers physical and societal aspects of environmental performance of the hotel sector and which does not require any quantitative information. Respondents in this study were asked to provide answers on a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree for environmental improvement statements.

A mean score is calculated whereby the highest mean score indicates the better environmental performance. Summaries of the instruments included in the questionnaire are as below:



- The hotel's environmental objectives and targets have been achieved.
- The hotel has a good environmental reputation
- The hotel is relatively efficient in the use of energy, water and other materials.
- The hotel has personnel with environmental protection training.
- The hotel has a stable relationship of cooperation with stakeholders.
- The personnel is proud of the hotel's environmental behaviour
- The travel agencies and tour operator are satisfied with the hotel's measures in environmental protection
- The managing board is satisfied with the hotel's environmental behaviour

Factor analysis<sup>40</sup> indicated that all items of environmental performance loaded on a single factor (percentage of common variance explained 77.67 percent) that supported the unidimensionality of the measurement instrument (refer to Appendix I). The Cronbach-alpha<sup>41</sup> of the environmental performance items is 0.959 which explain that the reliability<sup>42</sup> coefficient of internal consistency is higher than the expected level (0.70).

## **5.4.2 Mediating/Moderating variables**

### **5.4.2.1 .Environmental Management Control System**

Otley (1980, 1999) mentioned that in order to encourage new ideas and new issues in implementing a new strategy (such as an environmental strategy), a package of management control systems should be expected to help. A package management control system means a combination of multiple management control elements.

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<sup>40</sup> Factor analysis is the procedure to validate a scale or index by demonstrating that its constituent items load on the same factor, and drop proposed scale items which cross load on more than one factor.

<sup>41</sup> Cronbach-alpha is a reliability coefficient which measures internal consistency of the scale construction.

<sup>42</sup> Reliability means that the items were consistent and measured by the same construct (Pallant, 2004) and thus provide consistent results (Gatewood and Field, 1990)

According to contingency theory, the appropriateness of different control systems depends upon the setting of the business. Therefore, as suggested by Otley (1980) regarding 'package management control systems', the current study uses four management control mechanisms which make a significant contribution to the development of a new idea (i.e; environmental management) and thus, lead to better performance; firstly, interactive control system, secondly, environmental budgeting control system, thirdly, environmental information system and fourthly, cultural control system. As discussed in the previous chapter, these four elements of management control systems is building from the Simons' (1995) levers of control; interactive control systems, diagnostic control systems and belief control systems and adds with information-based system.

Thus, rather than simply describing the degree of the extensive use of the specific management control system in the environmental management literature, the current study describes the use of management control systems in terms of multiple management control elements. The presence of the extensive use of management control systems in environmental management practice can be detected as it comes from one of these four control systems.

The variables of the environmental management control system were operationalised by using the summated score of all the management control system variables (i.e. total summated score for the interactive control system (INTERACTIVE), the environmental budgeting control system (BUDGET), the environmental information system (EIS) and the cultural control system (CULTURE)). The integration of management control system into environmental management is called the environmental management control system (EMCS). A high score in any of the four mechanisms implies a high score in environmental management control system.

**Table 5.2:**

**Summary of Environmental Management Control System Elements**

<b>Moderating/mediating variables</b>	<b>Measurement</b>	<b>Source of data collection</b>
Interactive control system (INTERACTIVE)	5-point Likert scale (continuous)	Questionnaire
Environmental budgeting control system (BUDGET)	5-point Likert scale (continuous)	Questionnaire
Environmental information system (EIS)	5-point Likert scale (continuous)	Questionnaire
Cultural control system (CULTURE)	100-point scale (continuous) (standardised to 5-point Likert scale)	Questionnaire

#### 5.4.2.1.1 Interactive Control System (INTERACTIVE)

Based on Bisbe and Otley (2004), the interactive control system is a formal control system that managers are personally involved in decision making and this system acts forms a basis of interaction between organisational members. Simons (1995) argued that the involvement of managers in decision making will stimulate the firm learning and emerge a new ideas and new strategies. From the environmental management perspective, Hunt and Auster (1990), Henriques and Sadorsky (1999) and Baba (2004) mentioned that interactive control system involved top management and employees in environmental decision making in environmental proactive firms.

The interactive control system was measured by fourteen-item instrument based on the instrument suggested by Baba (2004). The study uses a five-point Likert scale to measure the use of the interactive control system into the environmental management practice.

Managers were asked to rate the items related to the interactive control system on a five-point Likert scale (from 1 (completely not true) to 5 (completely true)). A summated score<sup>43</sup> was created by adding the scores of each item and the mean score was also calculated. The high mean score indicates an extensive use of interactive top management and employee involvement in the environmental decision making of the hotel sector.

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<sup>43</sup> Summated score means total score and is achieved by adding all scores for each item.

Factor analysis indicated that twelve items loaded on one factor and were retained for analysis (refer to Appendix I). After removal of two items (INTERACTIVE8 and INTERACTIVE14) that loaded in the second factor, the variance explained the common factor is 71.712 percent<sup>44</sup>. The items loaded<sup>45</sup> in one factor could be interpreted as an extensive use or involvement of interactive control systems in order to support environmental management practices. The Cronbach alpha of the items retained is 0.964. The questions included in the questionnaire are as below:

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<sup>44</sup> According to Field (2000), removal of items was carried out using Kaiser's criterion in factor analysis procedure. Based on Kaiser's criterion, the factor should be retained when its eigenvalues greater than 1 and the criterion is accurate when variables are less than 30 and communalities after extraction are greater than 0.7. Based on these criteria, the items will be dropped for those with low communalities.

<sup>45</sup> Following Field (2000), the loading factor is the extent to which the indicator (or variables) is correlated with the latent variables and therefore, the measure of the validity of the latent variable. The loading factor >0.6 is considered high for the Likert scale.

- I am fully involved in setting up the environmental policy for my area of responsibility.
- I participate with other departmental managers in preparing the environmental policy for our hotel.
- I have extensive influence on the environmental policy for my area of responsibility.
- My contribution to the environmental policy for my hotel is not significantly important.
- Other managers and I attend meetings on the meaning and importance of environmental management.
- The management culture stressing personal involvement in environmental management is conducive to promoting employee trust.
- The hotel does not permit me to establish environmental improvement procedures in my area of responsibility.
- Generally, I know and understand the mission statement and environmental policy.
- Employees in this hotel have access to information that could be used to create total quality environmental management charts and graphs.
- Employees in this hotel are trained in Total Quality Environmental Management.
- This hotel uses diagrams of flow charts to highlight potential causes of environmental problems.
- Employees in my hotel use several Total Quality Environmental Management tools to eliminate or reduce controllable sources in the operating process.
- Employees in my hotel do not receive training in improving the environment in my organization.
- Employee empowerment in decision making is practised and encouraged.

#### **5.4.2.1.2 Environmental Budgeting Control System (BUDGET)**

According to Simons (1995), budgeting control system is one of the elements of diagnostic control systems. Bruns and Waterhouse (1975) mentioned that the budget was a control mechanism in every organisation. Sharma (2002) mentioned the characteristics of budgeting systems in the hotel sector depended on their role such as the budget as a communication tool, the budget as a management control tool, the budget as a performance evaluation tool, the budget as a forecasting frequency tool and the budget as a forecasting extensiveness tool. Henri and Journeault (2006), on the other hand, define the budget as a coordinating and communication tool which details all the environmental expenses, income and investments.

In this study, budgeting control refers to this as an environmental management control tool. Building from the premise that budgeting is one of the vital management tools to the hotel, the environmental budgeting control system was operationalised based on Baba's (2004) and Henri and Journeault's (2006) definition and measured using a five-point Likert scale, ranging from 1 (completely not true) to 5 (completely true).

The respondents were asked to rate to what extent the statement of environmental budgeting system in their hotel was true in terms of the integration of all the environmental management activities (expenses, income and investment) in the budgeting system. The total summated score was calculated by adding the scores of each item and the mean score was also created. A higher mean score suggests a more detailed integration of environmental matters in the budgeting of the hotels.

The environmental budgeting control system was measured by adapting an instrument developed by Baba (2004) containing fourteen items. The questions were slightly changed to suit the objectives of the study. The questions listed in the questionnaire are as follows:

- The hotel details the costs of training employees in the budget.
- The hotel details the costs of studying environmental impact in the budget.
- The hotel details the costs of auditing environmental risks in the budget.
- The hotel details the costs of developing environmental management systems in the budget.
- The hotel details the costs in cleaning up a polluted river or lake in the budget.
- The hotel details the costs in cleaning up oil spills in the budget.
- The hotel details the costs in cleaning up contaminated soil/land in the budget.
- The hotel details the costs in settling personal injury claims from environmentally unsound practices in the budget.
- The hotel details the costs in settling property damage claims in the budget.
- The hotel details the costs in restoring land to its natural state in the budget.
- The hotel details the costs in losing sales from a bad environmental reputation in the budget.
- The hotel details costs in receiving medical care because of polluted air (individual welfare) in the budget.
- The hotel details the costs in losing a lake for recreational use because of contamination (degradation) in the budget.
- The hotel details the costs in losing employment because of contamination (individual welfare) in the budget.



Factor analysis indicated that ten items loaded on one factor and were retained for analysis (refer to Appendix I). After the removal of four items (BUDG1, BUDG5, BUDG7 and BUDG9) that loaded in the second factor, the variance explained the common factor is 73.83 percent. The items loaded in one factor could be interpreted as an integrated or details of the budgeting control system in order to support environmental management practices. The Cronbach alpha of the items retained is 0.96.

#### **5.4.2.1.3 Environmental Information System (EIS)**

As mentioned before in Chapter Three, the environmental information system is a specific tool to collect the necessary environmental information. An example of environmental information systems is environmental auditing and reporting. Rezaee (2000) stated that environmental audit and reporting is a management tool that monitors and controls the firm's environmental performance and Baba (2004) also mentioned that environmental audit and reporting can monitor and minimise the risks to human health through a continuous process of reviewing and checking (see also Maltby, 1995 and Schaltegger et al., 2003).

The presence of an environmental information system as one of the management control system elements was checked by nine-item instruments of environmental audit and reporting, adapted from Maltby (1995). A five-point Likert scale ranging from 1 (completely not true) to 5 (completely true) is used. Respondents were asked to indicate to what extent the statements regarding environmental audit and reporting were true in the hotel sector.

The summated score was created by adding the score for each item and a mean score was also calculated. A high mean score indicates a more detailed integration of environmental matters in environmental information systems and it can be interpreted as indicating an extensive involvement in environmental information systems to collect the necessary information to help managers to monitor and control environmental management practices. A variance explained of common item for factor loading of six items (after removal of three item (EIS4, EIS8, EIS9)) is 69.265 percent and the Cronbach alpha for retained items is 0.912 (refer to Appendix I).

The items included in the questionnaire are as below:

- Hotels in hospitality industries should be required by law to produce an audited environmental report annually.
- An environmental audit is best described as a management tool and its use should be at the discretion of management.
- An environmental audit is primarily a means of ensuring compliance with legislation.
- An environmental audit is primarily a means of identifying opportunities for improving environmental performance.
- An environmental audit should be subject to a standard setting process defining the audit scope and the methodology used.
- Terms such as environmental audit, environmental review and environmental impact assessment can be used interchangeably.
- The scope and methodology of an environmental audit should be agreed between the auditor and the client and should not be predetermined by outside bodies.
- An environmental audit is essentially a review of systems and as such is similar to a financial audit.
- An environmental audit is chiefly concerned with identifying the impact of the clients' operations on the environment.

#### **5.4.2.1.4 Environmental Cultural Control System (CULTURE)**

Cultural control system is an element of belief system in Simons' (1995) levers of control. In this study, firm culture is measured using an adapted version of the Henri's (2006) instrument which was based on a competing-values perspective developed by The National Centre for Higher Education Management System. This instrument was validated and has been used recently in an accounting setting (Bhimani, 2003). However, to better reflect the environmental context related to the unit of analysis, the statement used is slightly changed.

This instrument asks respondents to distribute 100 points among four cultural types, which best describes their hotel, within each of the four dimensions of culture; institutional character, institutional leader, institutional cohesion and institutional emphasis. For each dimension, respondents must distribute 100 points among four sentences where sentence A refers to group culture, sentence B refers to development culture, sentence C refers to hierarchical culture and sentence D refers to rational culture.

The summation of the group-culture score and the development-culture score gives the flexibility-value score, while the summation value of the hierarchical-culture score and the rational-culture score gives the control-value score<sup>46</sup>. Then, the dominant type of culture of the firm can be accessed through the different scores of flexibility value and control value. A positive value means a flexibility-dominant type of culture and negative sign value means a control-dominant type of culture.

In order to standardise the score, the answer scale was recoded to 5-point Likert scale where the answer between range 0 to 20 is recoded as 1, 20 to 40 is recoded as 2, 40 to 60 is recoded as 3, 60 to 80 is recoded as 4 and 80 to 100 is recoded as 5.

The lists of questions with regards to the hotel environmental culture are as below:

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<sup>46</sup> For example: Case 1

GROUP	DEV	HIERARCHICAL	RATIONAL	FLEX	CONTROL	DOMINANT
50.00	30.00	10.00	10.00	80.00	20.00	60.00

Therefore, dominant type of culture for this case is flexibility control system, where dominant can be gained from flexibility value (group + development) minus control value (hierarchical + rational).

**1. Institutional characteristics (please distribute 100 points)**

- a. Hotel A is a very personal place. It is like an extended family. People share a lot of the facilities.\_\_\_\_\_
- b. Hotel B is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.\_\_\_\_\_
- c. Hotel C is a very formalized and structured place. Bureaucratic procedures generally govern what people do.\_\_\_\_\_
- d. Hotel D is very production oriented. A major concern is with getting the job done. People are not very happy.\_\_\_\_\_

**2. Institutional leader (please distribute 100 points)**

- a. The head of Hotel A is generally considered to be a mentor, a sage or a father or mother figure.\_\_\_\_\_
- b. The head of Hotel B is generally considered to be an entrepreneur, an innovator, or a risk taker.\_\_\_\_\_
- c. The head of Hotel C is generally considered to be a coordinator, an organizer or an administrator.\_\_\_\_\_
- d. The head of Hotel D is generally considered to be a producer, a technician or a hard-driver.\_\_\_\_\_

**3. Institutional cohesion (please distribute 100 points)**

- a. The glue that holds Hotel A together is loyalty and tradition. Commitment to this hotel runs high.\_\_\_\_\_
- b. The glue that holds Hotel B together is commitment to innovation and development. \_\_\_\_\_
- c. The glue that holds Hotel C together is formal rules and policies. Maintaining a smooth-running organization. \_\_\_\_\_
- d. The glue that holds Hotel D together is the emphasis on tasks and goal accomplishment. \_\_\_\_\_

**4. Institutional emphases (please distribute 100 points)**

- a. Hotel A emphasises human resources. High cohesion and morale in the hotel are important.\_\_\_\_\_
- b. Hotel B emphasises growth and acquiring new resources. Readiness to meet new challenges is important.\_\_\_\_\_
- c. Hotel C emphasises permanence and stability. Efficient, smooth operations are important.\_\_\_\_\_
- d. Hotel D emphasises competitive actions and achievement. Measurable goals are important.\_\_\_\_\_

The items load in two factors that were factor 1 is a flexibility value and factor 2 is a control value. Factor 1 (Flexibility value) has eigenvalue 1.338 with 66.897 percent variance explaining the common factor (The Cronbach-alpha is 0.603). On the other hand, factor 2 (control value) has eigenvalue 1.267 with 63.372 percent variance and 0.522 Cronbach-alpha (refer to Appendix I).

The dominant value of culture can be accessed by subtracting flexibility value from control value. The type of dominant value adopted by hotels shows the hotels' involvement in environmental management practice.

### **5.4.3 Independent Variables**

#### **5.4.3.1 Environmental Management Practices (ENVMGT)**

The measure of environmental management practices is drawn from an instrument used by Carmona-Moreno et al. (2004) and Gil et al. (2001). The adapted instrument consists of twenty-two items measured through a five-point Likert scale, ranging from 1 (very little commitment) to 5 (very strong commitment)

Hotels were asked to state whether or not they were carrying out a number of environmental management activities to prevent negative environmental impacts. Respondents were asked to rate to what extent they are committed to the activities. A mean score is computed where a high mean score indicates a high level of commitment which represents a proactive environmental strategy.

Splitting at the median of environmental management practices, two sub samples were created, where scores higher (lower) than the median were labelled high (low) commitment. This type of splitting is also used by Bisbe and Otley (2004).

The items listed in the questionnaire are:

- The hotel is using an environmental plan.
- The hotel is using a written document describing its environmental plan.
- The hotel gives priority to purchasing ecological products(eg:biodegradable, reusable, recyclable etc).
- The hotel stresses ecological issues when marketing its product.
- The hotel makes a selective collection of paper, oil, glass etc for recycling purposes.
- The hotel communicates its environmental plan to its shareholders
- The hotel communicates its environmental plan to its employees.
- The hotel is establishing or has established an environmental, health and safety unit.
- The hotel is developing a board or management committee or manager to dealing with environmental issues.
- The hotel conducts environmental and awareness training programmes for its employees.
- The hotel gives employees training about environmental issues.
- The hotel organizes or sponsors environmental protection activities.
- The hotel produces a separate report communicating environmental costs and savings.
- The hotel carries out an internal environmental audit.
- The hotel has a written document describing its environmental audit.
- The hotel quantifies its environmental savings and costs in a budget.
- The hotels facilities customers' collaboration in environmental protection (eg: voluntary changing towel etc).
- The hotel has procedures to check and revise environmental performance.
- The hotel is relatively efficient in the use of energy, water and other material.
- The hotel reduces the use of environmentally toxic and dangerous products (eg: Hygiene chemical etc).
- The hotel applies water saving practices.
- The hotel applies energy saving practices.

Factor analysis in Appendix I indicated that the twenty remaining items loaded in a single factor (percentage of common variance explained is 75.052 percent), which supported the one dimension of the measurement instrument. The internal consistency of the items included in the scale was assessed using Cronbach-alpha as a reliability coefficient and resulting alpha was 0.982 and the alpha is above 0.70, as recommended by Nunnally (1978).

#### **5.4.4 Control Variables**

The three control variables which are used in this study are hotel size, chain affiliation and hotel structure. Size and structure are used in many studies of environmental management practice or strategy and management control systems as control variables, such as Henri and Journeault (2006), Carmona-Moreno et al. (2004), Gil et al. (2001) and Sharma (2000). Chain affiliation is used as a control variable because this study uses the service sector as a unit of analysis and it was assumed by previous literature (for example, Carmona-Moreno et al. 2004) that practice in the service sector will be influenced by its chain affiliation.

##### **5.4.4.1 Hotel Size (SIZE)**

There are differences in the manner in which the firm's size is operationalised in the various studies. Past studies used a number of indicators to measure firm size. Samiee and Walters (1990) point out that the number of employees, the level of sales, and the value of firm assets are the most appropriate indicators of firm size. While in environmental literature, total assets (Romlah et al. 2002), number of employees (Harrington and Kendall, 2006; Mandraka and Kormenza, 2000) and annual sales



(Mandraka and Kormentza, 2000) are considered the most popular criteria to measure firm size. However, according to Samiee and Walters (1990), there are no universally accepted criteria for measuring firm size. As in service firm such as hotel sector, Carmona-Moreno et al. (2004), Gil et al. (2001) and Sharma (2000) used number of rooms to measure the size of the hotel.

In this study, the number of rooms was used as a proxy for firm size as the respondents of this study are from the hotel sector. Carmona-Moreno et al. (2004) suggest the preferred measurement for size of the hotel is the number of guest rooms. The current study does not use the number of employees as a proxy of the hotel size because it is known that hotel's employees are mainly seasonal (Sharma, 2000) and there is a large variation in total employee numbers over the year because most of them work on temporary basis. Sharma (2000) also mentioned that the number of guest rooms is a more stable indicator than the number of employees.

Different countries tend to use different standards and criteria to measure the size and standard of the hotels. In Malaysia, the hotel sector will be ranked in accordance with their number of guest rooms and it is expected that the larger the hotel is, the higher the number of guest rooms. It is believed that larger hotels have a considerable amount of capital to invest in the modernisation of their facilities and therefore, will enhance their reputation and achieve a higher star ranking (for example, a five-star hotel is normally a large hotel and has a large number of guest rooms in Malaysia). However, some of the hotels which comprise beach surroundings, modern facilities and a resort appearance do not necessarily follow the expectation. For example, Pulau Spring Resort Hotel which has only 23 rooms is rated as a 5-star hotel.

Even though there is a difference in measuring the size, the current study believes the number of room is the correct measurement for hotel size. Thus, the number of guest rooms is used as a proxy for size, as suggested by Carmona-Moreno et al. (2004) and Sharma (2000) and to operationalise it, size was measured as the natural log of the number of rooms for each hotel. Carmona-Moreno et al. (2004) and Gil et al. (2001) also operationalised size using a natural log<sup>47</sup>. Respondents were asked to state how many guest rooms they have in their hotel.

In addition, number of rooms can also be divided into three groups; large, medium and small size of hotel. The groups are based on Bohdanowicz's (2003) formula where a hotel with fewer than 50 rooms is a small hotel, ranging between 50 to 150 rooms is a medium hotel and over 150 rooms is a large hotel. The current study will use this formula to group the hotel in terms of size and to test the distribution and relationship between hotel size (this study uses large and medium size only for the reason previously mentioned) and environmental management practice and management control system.

#### **5.4.4.2 Hotel Structure (STRUCTURE)**

As discussed in Chapter Three, in order to implement environmental strategies in firms, there are several types of structure that can be implemented. However, according to Berry and Rondinelli (1998), in order to be more proactive, a decentralised approach should be followed by firms. They argue that this approach will enable firms to apply policies more easily by implementing them in separate

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<sup>47</sup> The natural log of number of rooms was used to constrain the range for statistical analysis (Hart and Banbury, 1994)

departments. In order to effectively support and implement environmental strategy and to fill the gap between plan and action, a firm needs a firm structure.

In this study, hotel structure was measured using the standard measurement used by Gordon and Narayanan (1984). They used a seven-point scale. However, in order to standardise the scale, in this study a five-point scale is used. As mentioned in Chapter Three, firm structure refers to complexity, formalisation and centralisation. Complexity is measured by counting the number of firm levels and the number of employees per manager (division of work). Formalisation is measured by job description and rules and procedures while centralisation, on the other hand, is measured by asking the degree to which decision making is concentrated to a single point in the organisation. All of this may help identify whether firms implement a mechanistic or an organic structure.

The construct structure was measured using five questions about specialization, delegation of the authority, description of job tasks, decision making levels and the mode of managerial styles. The instruments which pertain to the issue of hotel structure are as follows:

1. To what extent has authority been delegated to the appropriate senior managers for each of the following decision? [ 1=no delegation ----- 5= no delegation]
  - Development of new services
  - The hiring and firing of environmental managerial personnel
  - Selection of large investment
  - Budget allocations
  - Pricing decisions
2. Which of the following best characterizing the specification of actual job tasks in your hotel? [1= no formal description -----5= task are clearly specified]
3. Does your hotel publish an employees' manual? [5=basic ----- 1=detailed]
4. Most operating decisions are made at [5=lower level -----1=senior level]
5. The managerial styles (modes of decision making) of your hotel's senior managers are [5=range from informal to very formal ----- 1=conform to a uniform style]

The respondents were asked to scale their responses from one to five where the low end (number 1) of the scale represented a mechanistic structure and the high end (number 5), an organic structure. Then, a single scale was constructed by averaging a respondent's scores over all the questions pertaining to firm structure. Five items relating to the firm structure were factor analysed which produced one factor with an eigenvalue of 3.095 and explained 61.910 percent of the variability in firm structure. The Cronbach alpha is 0.836 (refer to Appendix I). Sharma (2000) also used the same instrument and had an eigenvalue 2.98 and variance of 60 percent<sup>48</sup>.

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<sup>48</sup> Gordon and Narayanan (1984) had eigenvalue >1 and explained 67 percent variance of the common factor.

#### 5.4.4.3 Hotel Chain (CHAIN)

According to Gil et al. (2001) and Carmona-Moreno et al. (2004), hotels may be classified into those belonging to a chain and those that are independent. They measure chain ownership as a dichotomous variable. The value of 1 is given when the hotel is affiliated to a chain and of 0 when the hotel is independent.

Practically, in Malaysia, the hotel sector can be categorised as to whether hotels belong to a chain or are independent. The higher rating hotels such as five-star and four-star-hotels in Malaysia are more likely to belong to a chain. Hence, to measure chain affiliation, the respondents were asked to state whether their hotel is affiliated to a chain or their hotel is independent.

Previous studies such as Carmona-Moreno et al. (2004) and Gil et al. (2001) suggested that chain affiliation has an influence on environmental management practice, therefore, this study also assumes that chain affiliation will influence hotels to practise environmental management activities. Due to that assumption, chain affiliation is measured using a dichotomous variable. If hotels have chain affiliation, they will be valued as '1' and if not, their value is '0'.

### 5.5 Interview-based approach

The research methodology employed in the second stage is the semi-structured interview approach. The semi-structured interview-based approach is conducted by telephone. As mentioned previously, the follow-up interview was carried out mainly to obtain clarification of the issues raised in the survey questionnaire. All the insignificant results were issues to be clarified. Theyel (2000) in his study on environmental management practice also used phone interview to follow-up the findings from the participants.

The telephone interviews took place with the hotel (hygiene) managers as a second phase of the study between January 2007 and February 2007. The interviews were lasting between one and half hours (1 ½ hours) to two hours (2 hours). Phone interviews were considered appropriate because the issues of the study do not measure the behaviour of the participant as a significant factor influencing the result. A phone interview was considered to be a suitable approach in order to get comments and elaborate on the issues or problems requiring further discussion. In addition, according to Sykes and Hoinville (1985) in their study of social attitude, the results from telephone and face-to-face interviews were very close. On the other hand, the unit of analysis is an organisation and not the employees. The participants involved in the interview session were presenting their hotel, and not themselves.

The sub-sample as chosen based on the agreement the participants gave on the back of the questionnaire that they would be interested in participating in the further interview stage. The interested participants were then contacted by e-mail or by telephone to set

up an appointment for a formal interview. The mutually date and time to call were also set. This effort is to reduce the cost as the call made was a long-distance call (overseas call).

Two weeks prior to the interview session, one set of interview questions was sent to the participant, either by post or by e-mail. This action is to ensure that the participant understands and clears all the questions asked and to ensure that the session will be successful. The interview questions were established after the analyses of the survey were performed and the results from the analysis were examined to ascertain what further interview questions were required in order to get some clarification or explanation (e.g. If there is any conflicting results in the Malaysian hotel sector and explore why the statistical results from the study were not consistent with prior studies outlined in the literature review). In order to check whether the meaning of the answer and response given has fully understood by the researcher, the written answer up immediately following the interview, were forwarded (by e-mail) to the participants for clarification. Amendments were made until a final version was agreed. Attempts were also made to minimise the interviewer bias<sup>49</sup> by introducing a topic in outline and allowing the participant to expand the topic with little influence from the interviewer.

As mentioned in the previous section, ten interviewees were selected from twenty respondents who agreed to participate in the interview stage. The ten out of twenty

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<sup>49</sup> Interviewer bias is actually a problem related to the structured interviews where the researcher tend to deliver questions in such a way as to influence the response, or the interviewee may be tended to respond in a particular way to satisfy the researcher.

interviewees<sup>50</sup> were selected based on the size of the hotel and all of the ten participants came from the large hotel size (number of rooms more than 150). The semi-structured interview questions (refer to Appendix III) were designed based on the results obtained from the first stage (questionnaire survey) and these included open questions in order for participants to answer them without any restriction. The answers for the interviews were written down (ticked in the right box) for the structured questions and unstructured questions were taped by using a hands-free phone speaker and written using shorthand<sup>51</sup>.

Before the actual interview was undertaken, a pilot run of the proposed interview was tested on three managers in the Welsh hotel sector. Ideally, the pilot study should have involved individuals who possess similar characteristics to the intended sample but time and financial constraints made it impractical to do so. Some of the questions had to be modified because either the questions were difficult to understand or that the questions could not meet the research objectives.

For example, further explanation is needed in order to clarify why some hotel sectors were still received complaint about their hotel's performance, even though they have a mission to reduce environmental impact and take proper initiatives to implement environmental practice. The question may be asked regarding the unplanned budget or employees' resistance to implement such activities.

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<sup>50</sup> The researcher decided not to take all the twenty participants because the further questions needed clarification are more likely valid to the large hotel attributes. On the other hand, the cost and time constraints are also the limitation because the call is an overseas call and very costly.

<sup>51</sup> The researcher did not have a proper training for shorthand skill but from the experience taking notes, the researcher is available to use the skill for a limited statement.

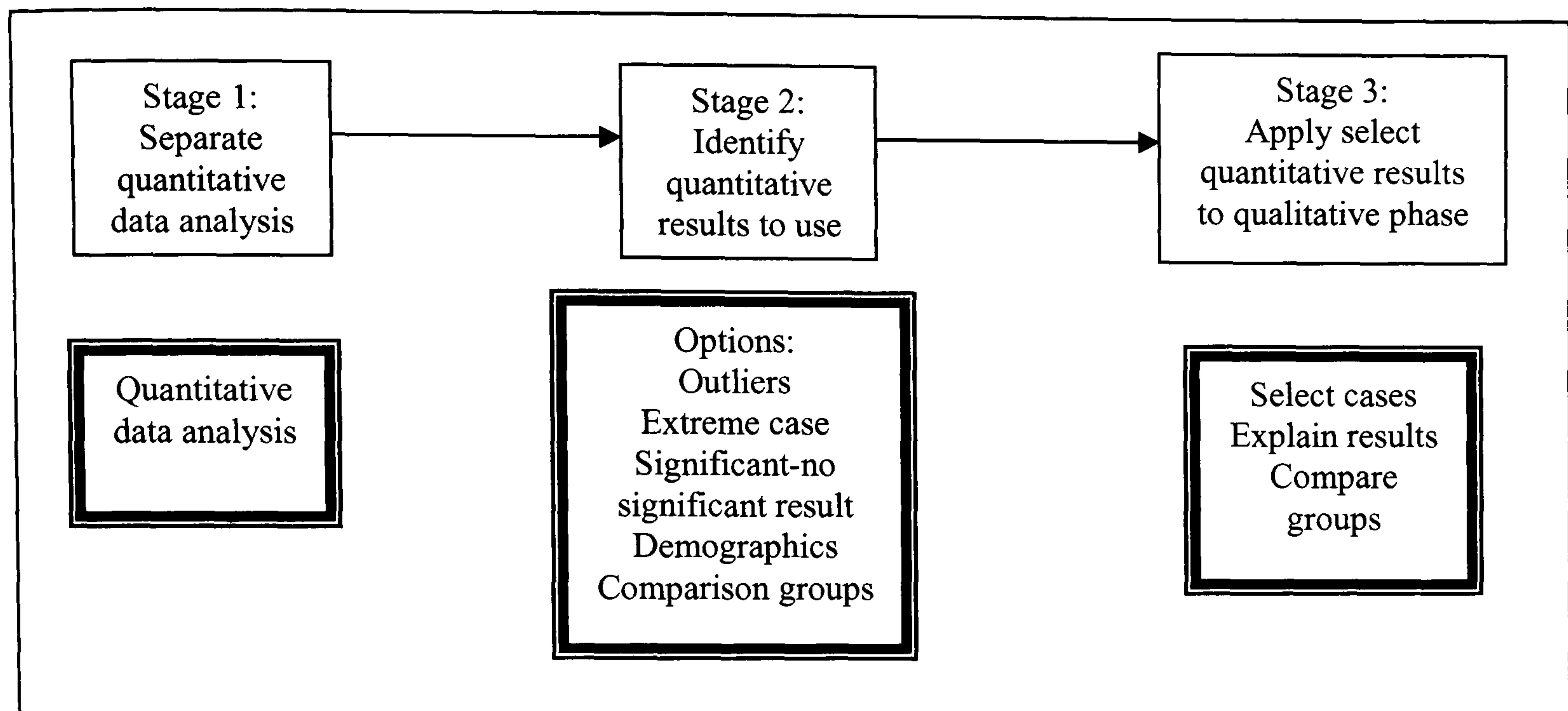


Following previous studies such as Manning and Cullum-Swan (1998) and Creswell (2003) and Creswell and Clark (2007), the interview data was analysed using a procedure called content analysis. The process of content analysis is one of the formal procedures to clarify the meaning and interpret qualitative data using locating key themes, patterns and ideas within the data (Clark et al., 1998; Neuendorf, 2002). No statistical analysis was conducted because the data obtained in this study is merely to clarify and further explain the first phase's result and interview questions were not asking the quantitative data. Furthermore, ten respondents are not enough for conducting statistically analysis.

## **5.6 Methods of Data Analysis**

As discussed in the previous section, Creswell and Clark (2007) stated that the purpose of the sequential mixed method analysis of the data is to use the information from the analysis of the first stage to inform the second stage. Referring to Figure 5.2, data analysis involves three stages: Firstly, quantitative data analysis, secondly, to identify quantitative result to use and thirdly, select quantitative result to build the qualitative phase

**Figure 5.2:**  
**Sequential Explanatory Designs**



Source: Creswell and Clark (2007; p 143)

In order to test the hypotheses developed in Chapter Four, descriptive analysis method, correlation analysis method and multiple regression analysis method are all used.

### 5.6.1 Descriptive Analysis

Even though the aim of descriptive analysis is merely to present the distribution of the variables used in the model and does not need to be used to test the hypothesis, this type of analysis (such as means, medians and standard deviations) is vital in order to support and to clarify the results from the multivariate analysis.

### 5.6.2 Correlation Analysis

Correlation analysis is used to explore the relationship between two variables (independent variable and dependent variable) individually. Correlation analysis is also used to examine the inter-relationship between independent variables in order to check the existence of multicollinearity<sup>52</sup> problems in the model.

### 5.6.3 Multiple Regression Analysis

Multiple regression analysis is used to test the hypotheses which were developed in Chapter Four. The hypotheses were developed on the basis of contingency theory, where the design of the environmental management control system is contingent upon environmental management practice. On the other hand, the hypotheses are also developed to examine whether environmental management control systems can influence the relationship between environmental management practice and environmental performance.

Multiple regressions are used due to the fact that all the variables are continuous data in nature. The relationship among environmental management practices, environmental management control system and environmental performance is measured simultaneously using standard multiple regression<sup>53</sup>.

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<sup>52</sup> Multicollinearity exists when the independent variables are highly correlated ( $r=0.9$  and above) (Pallant, 2004).

<sup>53</sup> In standard multiple regression, all the independent (predictor) variables are entered into the equation simultaneously. This type of multiple regression can also show how much unique variance in the dependent variable can be explained by the independent variable (Pallant, 2004).

Furthermore, in order to test the moderating or mediating effect of environmental management control systems on the relationship between environmental management practice and environmental performance, moderated hierarchical multiple regressions is used. This method was first suggested by Baron and Kenny (1986). Hierarchical multiple regressions<sup>54</sup> are also known as traditional path analysis using multiple regressions (Sharma, 2002) and used to compute the direct and indirect path coefficient<sup>55</sup>. This type of analysis was used by Sharma (2000) and Bisbe and Otley (2004).

#### 5.6.4 Other analysis

Beside all the analyses mentioned above, analysis using independent T-test is also carried out in order to examine the difference in the mean of dependent variables between two groups. Cross-tabulation test is also used.

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<sup>54</sup> Hierarchical multiple regressions are a method where the independent variables are entered into the equation in the order specified by the researcher based on theoretical grounds. Each independent variable is being assessed in terms of what it adds to the prediction of the dependent variables after the previous variables are controlled for (Pallant, 2004; 135). For example, if the current study wants to know how much the unique contribution of environmental management control system is to environmental performance, while controlling for environmental management practice, the procedure is to put the environmental management practice first in the equation, then followed by environmental management control system.

<sup>55</sup> The possibility of using Structural Equation Model (SEM) in which measurement of latent variable analysis and structural analysis were conducted simultaneously was ruled out on the basis of the large sample size required by SEM (Hoyle, 1995). Bisbe and Otley (2004) mentioned that this limitation also applies to moderation models. Sharma (2000) stated that the minimum sample size increases with the number of parameters (hypotheses) to estimate increases. It is acknowledged by Sharma (2000) that traditional path analysis assumes no random measurement error in the measurement scales.

## 5.7 Chapter Summary

This chapter describes the data collection, the sample of the study, the measurement and the method used to achieve the objectives of the study. This study is to investigate the links between environmental management practice, environmental management control systems and environmental performance. In order to achieve the objective of the study, two methods are used; questionnaire surveys and interview surveys. The questionnaire survey was used to obtain the data relating to assessing environmental management practice, environmental management control system and environmental performance from 300 hotels in Malaysia, which are listed in Accommodation book. The in-depth interview survey was used to clarify and explain more fully areas of complexity and vagueness from the questionnaire survey.

The interactive control system, the budgeting control system, the environmental information system and the environmental culture control system are proxy to the environmental management control system. The data were analysed using descriptive analysis, correlation analysis and multiple regression in order to justify the hypotheses developed and hence, to meet the objectives of the study.

## Analyses and Findings

### 6.1 Introduction

The aims of the chapter are to present the results of the questionnaire survey data analysis and the testing of the hypotheses formulated for the study. Generally, three types of analysis are used to examine the relationship between environmental management practice, management control systems and environmental performance. The analyses are Descriptive Analysis, Correlation Analysis and Multiple Regression Analysis. In order to test the effect of the management control system on the relationship between environmental management practice and environmental performance, the hierarchical multiple regression method<sup>55</sup> is used.

This chapter also provides the results from the interview survey which was used to clarify the issues raised from the results of the questionnaire survey.

The chapter is divided into several sections. The discussion is started with the profile of the respondents used in the study. Section 6.2 highlights the descriptive statistics which relate to all the variables involved in the model. Section 6.4 presents the result of the analysis of the Pearson Correlation statistics, while Section 6.5 reports the Regression analysis. Finally, the summary of the chapter is presented. The findings will be discussed in relation to relevant literatures in Chapter 7.

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<sup>55</sup> The path analysis using multiple regression (Bisbe and Otley, 2004 and Sharma, 2002) or hierarchical multiple regression method is used in order to test direct and indirect effects, while moderated hierarchical multiple regression is used to test the moderating effect (Baron and Kenny, 1986). The mediating effect is normally used interchangeably with indirect effect, while the moderating effect is used interchangeably with interaction effect through the thesis.

## 6.2 The Respondents Background Statistics

This section presents the profiles of the two samples of respondents; firstly, from the questionnaire survey and secondly, from the interview survey. As mentioned in Chapter Five, the unit of analysis is the hotel and the hotels in the sample of the study were chosen from The Accommodation Guide 2004. Three hundred questionnaires were mailed to medium and large hotels<sup>56</sup> of which one hundred and twenty-five were returned and all of them were usable. The response rate is therefore 41.7 % (refer to Table 5.1 Chapter Five). However, after considering one case of an outlier<sup>57</sup>, only 124 samples are used in all of the analyses.

A total of ten respondents were selected from twenty respondents who agreed to participate in the second phase interview survey. The ten interviewees were selected based on the hotel size and all of them came from the larger hotel (rooms more than 150). Basically, the reason of selecting participants from the larger hotel because the questions which needed further clarification are more likely related to larger hotel's attributes. Furthermore, apart from the other ten come from medium size hotels, time and cost constraints are stated as factors for not contacting the other ten respondents who agreed to participate in the interview survey.

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<sup>56</sup> Medium and large hotels are measured based on Bohdanowicz's (2003) measurement, where medium size is between 50-150 rooms and large size is hotels which have over 150 rooms. Small size is not included since previous literatures do not highlight the significant influence of small companies on environmental management practice (see Carmona-Moreno-Moreno et al., 2004; Gil et al., 2001; Sharma 2002).

<sup>57</sup> As suggested by Tabachnick and Fidell (1996), cases which have a standard residual of more or less than +/- 3.3 is considered as an outlier. Therefore, by using scatter plot and Mahalanobis distance, only one case (i.e. case 54) outlier is found in this study.

### 6.2.1 The Respondents' Profile from the Questionnaire Survey

Table 6.1 displays the distribution of the respondents based on the hotel's geographical area. From the table, it is shown that the 'medium hotels group' represents 63.7 percent of the overall respondents while the 'large hotels group' represents 36.3 percent. It was expected that most of the large hotels are based in the west part of Peninsular Malaysia because Kuala Lumpur is the Capital of Malaysia and most of the large hotels are located in that city (16 of the large hotels group are based in this region). Table 6.1 also shows that the percentage of respondents is quite similar among all regions in Peninsular Malaysia<sup>58</sup> and slightly lower in East Malaysia (Sabah and Sarawak). Based on the following Table 6.1, the respondents in the sample of the study are likely spread across the country.

**Table 6.1:**

**Respondents Profiles Based on Size and Geographical Area**

Region <sup>59</sup> Hotel Size	Medium hotels groups	Large hotels groups	Total
North Peninsular	25	7	32
South Peninsular	13	11	24
East Peninsular	21	7	28
West Peninsular	10	16	26
East Malaysia	10	4	14
Total	79 (63.7%)	45 (36.3%)	124

<sup>58</sup> Malaysia is divided into two parts; first, Peninsular Malaysia which comprises North, South, East and West Peninsular Malaysia and second, East Malaysia which comprises Sabah and Sarawak (refer to Appendix IV for a map of Peninsular and East Malaysia).

<sup>59</sup> Hotel regions includes North Peninsular Malaysia (Perlis, Kedah, Pulau Pinang and Perak), South Peninsular Malaysia (Johor, Melaka, Negeri Sembilan), East Peninsular Malaysia (Kelantan, Terengganu, Pahang), West Peninsular Malaysia (Kuala Lumpur, Selangor, Labuan) and East Malaysia (Sabah and Sarawak) and others



**Table 6.2:**  
**Respondents Profiles Based on Size and**  
**Environmental Management Commitment Level**

Level <sup>60</sup> Size	Medium Hotels Group	Large Hotels Group	Total
Low Commitment	56	9	65 (52.4%)
High Commitment	23	36	59 (47.6%)
Total	79	45	124 (100%)

Chi-Square value ( $X^2$ ) = 29.8

Significant  $p < 0.05$

Table 6.2 shows the level of commitment depending on the size of the hotel. It highlights that almost 47.6 percent of the hotels have a high level of commitment towards environmental management practices. Out of the 59 hotels which show high commitment concerning environmental management practice, 61 percent come from the large hotels group. This supports previous literature (such as Carmona-Moreno et al., 2004; Gil et al., 2001) which suggests that the larger hotels are most active in this area and significantly more likely to have engagement with environmental management practice.

The respondents can also be classified based on their job responsibility. The questionnaire asked the respondents to tick the appropriate responsibility they hold in their hotels. Table 6.3 displays the percentage of the respondents based on job responsibility.

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<sup>60</sup> Level of environmental management commitment is splitting at median level. The figure higher than median was labelled as high commitment, otherwise lower than median was labelled as low commitment. This procedure was also used by Bisbe and Otley (2004).

**Table 6.3:**  
**Job responsibility and Size of the Hotel**

<b>JOB RESPONSIBILITY</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Medium Hotel</b>	<b>Large Hotel</b>
Senior manager	46	37.1%	38	8
Human resource manager	35	28.3%	27	8
Environmental manager	19	15.3%	2	17
Finance manager	13	10.5%	4	9
Production manager	6	4.8%	3	3
Marketing manager	3	2.4%	3	0
Others	2	1.6%	2	0
<b>Total</b>	<b>124</b>	<b>100%</b>	<b>79</b>	<b>45</b>

The table shows that the respondents from the medium hotel were more likely to be the senior manager. Senior manager represents 37.1 percent of the total responses, followed by the human resource manager, 28.3 percent. Most of the environmental managers (89.5%) who answered the questionnaire were from the large size hotels. Finance managers were also more likely to be the respondents from the large hotels. Results from Table 6.3 are related to Table 6.2 where hotels in the sample which are highly committed to environmental issues are mostly from larger hotels and therefore, they are more likely to be more proactive and have separate departments, such as a Health, Hygiene and Safety department and a special environmental manager, to manage environmental matters.

### 6.2.2 The Respondents' Profiles From the Interview Survey

As mentioned in Chapter Five, ten interviewees were selected from the twenty respondents who agreed to participate in the interview stage. Table 6.4 shows the profiles of these interviewees classified into four important aspects; job responsibility, age, experience with environmental management practice and experience of working in the hotel sector. As previously mentioned, all of them are from the large hotel groups.

**Table 6.4:**  
**Interviewees' Profiles**

Aspect		N=10	Percentage
Job responsibility	Environmental manager	5	50%
	Finance manager	2	20%
	Human resource manager	2	20%
	Senior manager	1	10%
Age	< 30 year-old	2	20%
	31-50 year-old	6	60%
	> 50 year-old	2	20%
Experience with environmental management practice	1-2 year	4	40%
	3-5 year	4	40%
	> 5 year	2	20%
Experience working in hotel sector	1-2 year	0	0%
	3-5	4	40%
	> 5 year	6	60%

Table 6.4 shows that 50 percent of respondents are environmental managers. This finding suggests that most of the larger hotels have an environmental manager and this result suggests that the larger hotels in Malaysia are likely to have a speciality in managing environmental issues. This finding confirms the finding from the questionnaire survey that large hotels are proactive and have separate department to manage the environmental issues related to their hotel. Regarding age, 60 percent of the respondents are in the range 31 to 50 years-old.

Furthermore, Table 6.4 also shows that even though most of the managers interviewed have more than 5 years working experience in the hotel industry, only 20 percent of the respondents have experience with environmental management practice. This finding is possibly because the practice of environmental management is just becoming an area of concern for the hotel industry.

### **6.3 Descriptive Statistics Analysis**

This analysis is to present the distribution of each variable based on mean, median, standard deviation, minimum and maximum for the total sample of 124 hotels. One dependent variable (i.e. environmental performance), three control variables (i.e. chain affiliation, hotel size and hotel structure), one independent variable (i.e. environmental management practice) and four moderating or mediating variables (i.e. interactive control system, budgeting control system, environmental information system and cultural control system) which are measured with continuous measurement involved in this descriptive analysis. Results from the analysis are showed in Table 6.5 below.

**Table 6.5:**  
**Descriptive Statistics of the observation N=124**

<b>Variables</b>	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
Chain affiliation (CHAIN)	0.315	0.000	0.466	0	1
Hotel size (SIZE)	164.161	125.000	113.872	52	498
Environmental management practice (ENVMGT)	55.210	56.000	22.621	20	100
Environmental information system (EIS)	22.156	21.500	5.716	6	30
Interactive control system (INTERACTIVE)	38.116	39.000	14.425	13	65
Budgeting control system (BUDGET)	27.141	30.000	11.681	10	50
Cultural control system (dominant) <sup>61</sup> (CULTURE)	-0.2016	0.000	6.650	-12	12
Hotel structure (STRUCTURE)	14.190	14.000	5.171	5	24
Environmental performance (ENVPERF)	27.06	26.000	6.345	10	40

**Notes:** All variables except for CULTURE, CHAIN and SIZE were measured by using 5-point-likert scale. CULTURE was measured by using scale 1 to 100 points but in order to standardised the scale, it was recoded to 5-point likert scale. CHAIN was a dichotomous variable (0=No chain, 1=Chain) and SIZE was measured by number of rooms.

<sup>61</sup> The definition of each type has been discussed in Chapter Three, subsection 3.3.4.4. In short, the hotels in the sample tend to deploy a control-dominant type of culture. The mean sign is negative (i.e. mean flexibility-dominant type < mean control-dominant type). See subsection 5.4.2.1.4 for the details.

Table 6.5 reveals that, the mean SIZE fall at 164 to 165 rooms. The mean SIZE (164.161) is higher than median SIZE (125.000) with a wider range of SIZE between 52 to 498 rooms. The mean of size of the hotel is quite similar to Sharma's (2002) findings where he reports a mean for his sample of 163.71 rooms. The analysis also shows that around half (more than 50 percent) of the sampled hotels in Malaysia engage in environmental management practice and this result reveals that the awareness of environmental issues among the hotels is possibly quite encouraging.

The table also highlights that mean INTERACTIVE is about 38 percent and this figure is quite similar to median INTERACTIVE (39 percent). This result reveals that top management and personnel of the sampled hotels in Malaysia is likely becoming more concern on the practice of environmental management to ensuring the probability of achieving better environmental performance.

Analysis also reveals that on average 22 percent of the hotels in the study applied environmental information system and on average 27 percent of the hotels have the budgeting control system. This figures show that the sampled hotels in Malaysia appears to be aware the need to prioritise environmental matters. As mentioned in the literature review, Baba (2004), for example, recommends that environmental costs should be declared in budgets and the aspect of transparency should be disclosed in a formal environmental report.

Cultural control system also shows a negative mean score of -0.2016 and a median CULTURE of 0.000. The negative sign in mean CULTURE means that the majority of the sampled hotels are likely applying the control-type of culture. As discussed in previous Chapter, the control-type of culture is applied when flexibility value is less than control value.

Table 6.5 also highlights that mean STRUCTURE of 14.190 is quite similar to median STRUCTURE of 14. This result reveals that hotels in this survey have an organic-type structure which low complexity, low formalisation and decentralised decision making<sup>62</sup>. It was shown by the high end figure which is above the minimum average of the range. This result is possibly explained by the commitment of the hotels towards implementing environmental management practices is likely to be based on their home base office or their chain affiliated decision making. As Carmona-Moreno et al. (2004) mentioned chain affiliation tends to promote standardisation of the form of activities carried out by the hotel management and thus will influence hotels to form their firm structure.

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<sup>62</sup> Refer to Gordon and Narayanan (1984) and Chapter Three, subsection 3.4.2 for details and explanation.

#### 6.4 Correlation Analysis

Correlation Analysis is used in order to meet three objectives. First, this analysis is important to show the individual relationship between two variables. In this study, the analysis is used to show the strength and direction of a linear relationship between environmental management practice, an environmental management control system and each of the control variables to a hotel's environmental performance. Second, the analysis is also used to examine inter-correlation between variables and third, the analysis is used to detect multicollinearity<sup>63</sup> problems. According to Pallant (2004), high inter-correlation (more than 0.9) means there is a multicollinearity problem in the research model and Sharma (1996) mentioned this problem will reduce the explanation power of the independent variables.

Table 6.6 presents the correlations between the independent variables, moderating or mediating variables and control variables with dependent variables. The table highlights that all following variables have a positive and significant correlation at the 1 percent level with environmental performance<sup>64</sup>, except for cultural control system (CULTURE) and hotel size (SIZE) at 5 percent level.

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<sup>63</sup> Multicollinearity refers to the relationship between the independent variables. The multicollinearity problem is discussed in depth in the section 6.5.1.3.

<sup>64</sup> Environmental performance is measured using subjective measurement (5-point likert scale) and was adapted from Carmona-Moreno et al. (2004).



- Environmental management practice (ENVMGT)
- Environmental management control system (EMCS)
- Interactive control system (INTERACTIVE)
- Budgeting control system (BUDGET)
- Hotel structure (STRUCTURE)
- Chain affiliation (CHAIN)

The variable proxying the environmental information system (EIS), however does not significantly correlate with environmental performance, although the sign of the relationship is as expected.

In order to investigate the relationship between the variables, this study uses Cohen's (1988) guidelines<sup>65</sup>. Table 6.6 shows that the variable culture (CULTURE) either has less strength relationship or no significant relationship to the other variables. The relationship of either strong or medium strength exists between most of the independent variables but less strength correlation, as defined by Cohen (1988) exists between the following variables,

- BUDGET with EIS
- STRUCTURE with CHAIN and EIS
- SIZE with INTERACTIVE and BUDGET.

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<sup>65</sup> Cohen's (1988) guideline mentioned that if a correlation coefficient is between +/- 0.1 and +/- 0.29, the strength of relationship is small. If  $r$  is between +/- 0.3 and +/- 0.49, the strength is at a medium level and if  $r$  is between +/- 0.5 and +/-1.0, the strength of relationship is large or strong.

**Table 6.6:**  
**The Correlation Analysis**

Variables	SIZE	CHAIN	STRUCTURE	EIS	INTERACTIVE	BUDGET	CULTURE	ENVMGT	EMCS	ENVPERF
SIZE	1	0.637**	0.055	0.365**	0.232*	0.239**	0.006	0.656**	0.298**	0.228*
CHAIN		1	0.203*	0.324**	0.344**	0.342**	0.102	0.607**	0.407**	0.273**
STRUCTURE			1	0.181*	0.798**	0.514**	0.172	0.318**	0.687***	0.561**
EIS				1	0.332**	0.233*	-0.100	0.597**	0.440**	0.080
INTERACTIVE					1	0.711**	0.254**	0.483**	0.919**	0.488**
BUDGET						1	0.218*	0.302**	0.859**	0.468**
CULTURE							1	0.234**	0.464**	0.178*
ENVMGT								1	0.555**.	0.261**
EMCS									1	0.486**
ENVPERF										1

\*\*Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

As previously mentioned, the Correlation Analysis is also used to identify if there is a possibility of multicollinearity problems among the independent or predictor variables which can affect their relationship with dependent variable in the regression analysis (Hair et al., 1998; Pallant, 2004). As Pallant (2004) mentioned that inter-correlation of more than 0.9 means the existence of such a problem. Hair et al. (1998) also suggested that maximum value in order that the relationship can be accepted is 0.8 and that it should not influence the relationship with dependent variables.

From Table 6.6, the highest coefficient correlation ( $r$ ) is 0.798 between STRUCTURE and INTERACTIVE. As the variables INTERACTIVE and BUDGET are subset of the variable proxying environmental management control system (EMCS), their correlations are not discussed. The variables of environmental management practices, environmental management control system<sup>66</sup> and environmental performance are also positively and significantly correlated to each other. There is no sign of multicollinearity between these relationships because following Hair et al. (1998), all the coefficient values of those relationships are less than 0.8.

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<sup>66</sup> Environmental management control systems are measured using the summated score of all management control system variables, as discussed in 5.4.2.1.

## 6.5 The Hypotheses Testing

In order to test the hypotheses developed in Chapter Four, two types of multiple regression analysis are used. First, standard multiple regression is used to test the relationship simultaneously and second, hierarchical multiple regression is used to test the direct and indirect effects<sup>67</sup> and moderating effects of the relationship.

### 6.5.1 The Multiple Regression Analysis

Multiple regression analysis is used to explain how well a set of variables are able to predict a particular outcome. Based on Hair et al. (1998) and Pallant (2004), an important part of the regression analysis is checking whether or not the basic assumptions of normality, linearity and multicollinearity are met. All the assumptions are discussed in the next section.

#### 6.5.1.1 Normality

Normality means the data is symmetrical and has a bell shaped curve (Pallant, 2004). Normality test in SPSS 14 can be assessed among others by using the Kolmogorov-Smirnov test<sup>68</sup> and the kurtosis and skewness ratio test<sup>69</sup>. The analysis of normality is shown in Table 6.7.

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<sup>67</sup> As previously mentioned, indirect effects and mediating effects are used interchangeably throughout the thesis.

<sup>68</sup> Kolmogorov-Smirnov test is the test which compares the set of scores in the sample to a normally distributed set of scores with the same mean and standard deviation (Field, 2000). If the test is non-significant ( $p > 0.05$ ), the distribution of the sample is normal, and if the test is significant ( $p < 0.05$ ), the distribution is not normal.

<sup>69</sup> The skewness and kurtosis ratio test is a test which examines the distribution of scores on continuous variables (Pallant, 2004). According to Pallant (2004), if the data is perfectly normal distributed, the skewness and kurtosis value would be 0, but reports that this is uncommon in social science research.

**Table 6.7:**  
**Normality Test**

Variables	Kolmogorov-Smirnov	Kurtosis	Z value <sup>70</sup> = (kurtosis $\sqrt{24/N}$ )	Skewness	Z value <sup>71</sup> = (Skewness $\sqrt{6/N}$ )
Environmental management practice (ENVMGT)	0.072	-0.853	-1.94	0.290	1.32
Interactive control system (INTERACTIVE)	<b>0.013</b>	-0.682	<b>-1.55</b>	0.156	<b>0.71</b>
Budgeting control system (BUDGET)	<b>0.000</b>	-0.574	-1.30	0.444	2.02
Environmental information system (EIS)	<b>0.003</b>	-0.310	<b>-0.70</b>	-0.349	<b>-1.59</b>
Environmental culture (CULTURE)	<b>0.031</b>	-0.655	<b>-1.49</b>	-0.216	<b>-0.98</b>
Size of the hotel (SIZE)	<b>0.001</b>	-0.940	-2.14	0.406	1.85
Hotel structure (STRUCTURE)	0.200	-0.758	-1.72	-0.144	-0.65

*Note: Bold figures in Kolmogorov-Smirnov column are significant value at  $p < 0.05$  and the hypothesis that the sample is normally distributed is rejected.*

Table 6.7 reveals that all variables violate normality, except for ENVMGT and STRUCTURE. However, based on Hair et al.(1998), if the z value for skewness and kurtosis together fall between range  $\pm 1.96$ , then the assumption about the normality can be accepted. Therefore, from Table 6.7, it is shown that based on z value for both Skewness and Kurtosis, all variables fall within this range except for variables BUDGET and SIZE.

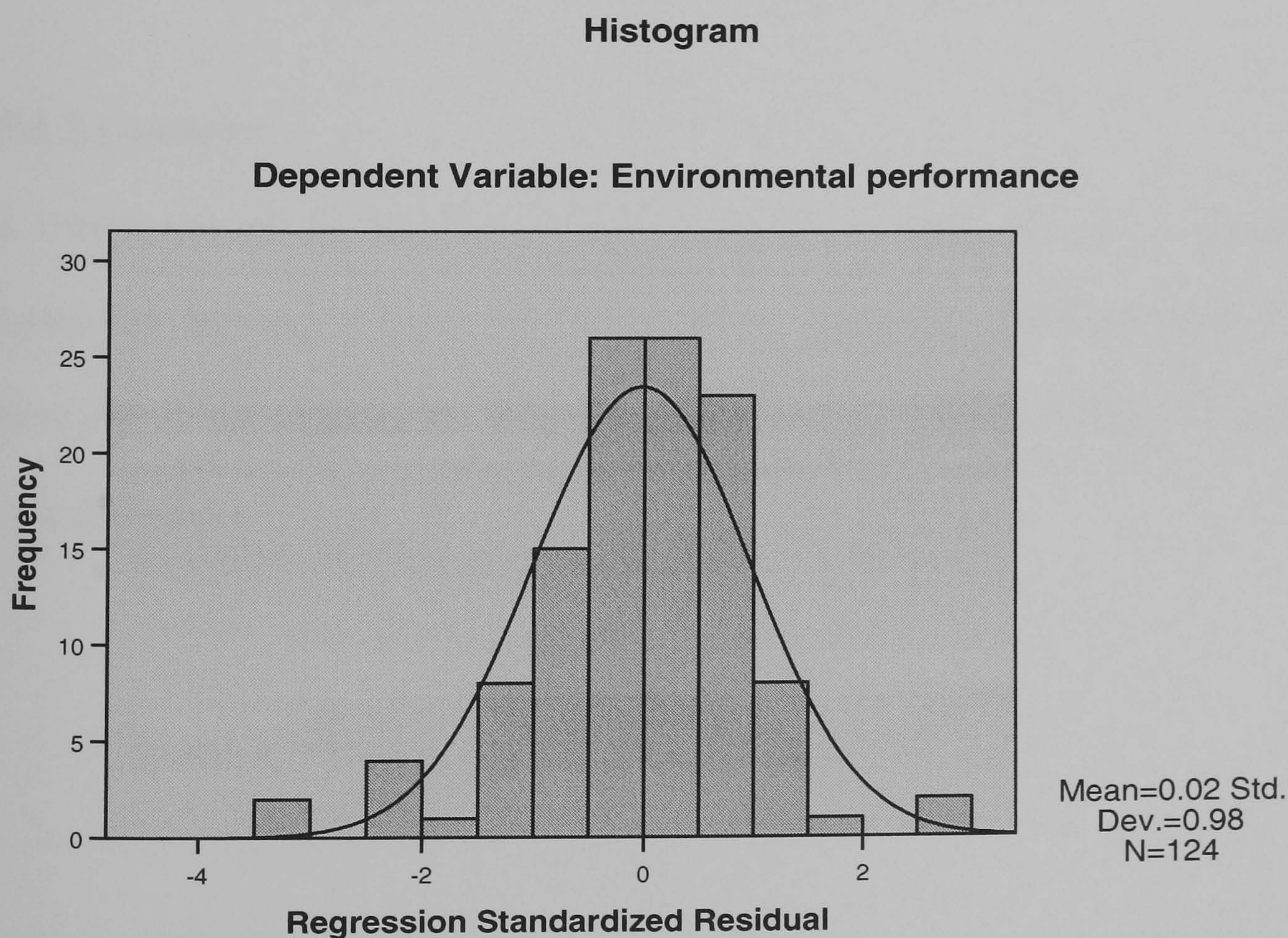
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<sup>70</sup> and <sup>71</sup> According to Pallant (2004), the z values are derived by dividing the statistics by the appropriate standard error of 0.220 (skewness) and 0.440 (Kurtosis). The value of 0.220 is come from the formula  $\sqrt{6/N}$  and the value of 0.440 is from the formula  $\sqrt{24/N}$ . For example, ENVMGT z value kurtosis:

$$= \frac{-0.853}{\sqrt{24/124}} = \frac{-0.853}{0.44} = -1.94$$

Even though the tests of Kolmogorov-Smirnov, skewness and kurtosis can detect the normality of data distribution, according to Hair et al. (1998), this test of significance is less useful with small samples (fewer than 30) but quite sensitive for large samples (in excess of 1000)<sup>72</sup>. Therefore, Hair et al. (1998) suggested to use also graphical plots and statistical tests (such as Kolmogorov-Smirnov, Skewness and Kurtosis test) to confirm the normality assumption. Figure 6.1 shows the histogram for standardised residual values about the predicted dependent variables (Environmental Performance)

**Figure 6.1:**  
**The Histogram to Test the Normality**



<sup>72</sup> This statement means that when samples are small, tests are not powerful which they tend to accept the null hypothesis (type 2 errors) even if it is false, and when samples are large, the tests will lead to reject the null hypothesis (type 1 errors) (Field, 2000).

Figure 6.1 above shows the bell distribution of the data and it is symmetrical. Based on Norusis (1995), a standard normal distribution should have a mean of 0 and standard deviation of 1. The residuals are the difference between the obtained and the predicted dependent variables (environmental performance) scores.

Therefore, in sum, the graph suggests the data could be a sample from a normal population and suggesting the normality assumption is not seriously violated. However, Tabachnik and Fidell (1989) explained that even though data is not normally distributed, the regression analysis method can still be used because non-normality will only affect the standard deviations and not the research findings. Care, however, should be taken in interpreting the standard deviations.

#### **6.5.1.2 Linearity**

As mentioned in the previous section, in order to use regression analysis, the relationship between independent variables and dependent variables should be linear. The result of testing for linearity by using the simple regression analysis is shown in Table 6.8 below.

**Table 6.8:**  
**Linearity Test**

Pair of variables	df	F	Sig. F
Environmental management practice - Environmental performance	1	8.884	0.003**
Environmental information system – Environmental performance	1	0.766	0.383
Interactive control system – Environmental performance	1	37.290	0.000**
Budgeting control system – Environmental performance	1	33.438	0.000**
Cultural control system – Environmental performance	1	3.999	0.048*
Hotel size – Environmental performance	1	6.669	0.011*
Hotel structure – Environmental performance	1	55.972	0.000**
Chain affiliation – Environmental performance	1	9.859	0.002**

\*\* Significant at 0.01 level

\*Significant at 0.05 level

Table 6.8 shows that all the variables have linear relationship, except the environmental information system (EIS) which does not have a linear relationship with environmental performance. As the assumption of a linear relationship between these two variables, care should be taken in the interpretation of the result.

### 6.5.1.3 Multicollinearity

Collinearity Diagnostic Test is used to examine the possibility of the existence of multicollinearity problems in the model. To detect the severity of multicollinearity, the variance of inflation factors (VIFs)<sup>73</sup> procedure in the Collinearity Diagnostic Test is used. Based on Baba (2004), the VIFs will ensure the collinearity problems will not harm the accuracy and stability of the model's parameter estimates. Based on

<sup>73</sup> The VIFs measures how much the variance of the estimated regression coefficient are inflated as compared to when the independent variables are not linearly related (Baba, 2004). VIFs can be derived from the formula  $1/\text{tolerance}$  which tolerance is equal to  $1-R^2$ .



Pallant (2004), if the tolerance value is very low (near 0), then it suggests that multiple correlations with other variables is high and there is a possibility of multicollinearity. However, according to Hair et al. (1998), acceptable values of collinearity for analysis of regression are considered from the tolerance value of more than 0.10 or the VIFs value of less than 10. A general rule of this assumption according to Belsley et al.(1980) also suggest that VIFs of the variables must not exceed 10.

**Table 6.9:**  
**Collinearity Diagnostic Test**

Variables	Tolerance value	VIFs value
Environmental management practice (ENVMGT)	0.283	3.536
Interactive control system (INTERACTIVE)	0.203	4.933
Budgeting control system (BUDGET)	0.450	2.220
Environmental information system (EIS)	0.553	1.808
Environmental culture (CULTURE)	0.766	1.355
Size of the hotel (SIZE)	0.426	2.349
Hotel structure (STRUCTURE)	0.335	2.987
Chain affiliation (CHAIN)	0.507	1.972

As shown in Table 6.9, there appears to be no evidence of the existence of severe multicollinearity in the relationships between each construct in the model. All the variables in the model have tolerance values of more than 0.10 and the VIFs value of considerably less than 10. Therefore, the figures suggest that collinearity should not be a severe problem for this model.

### 6.5.2 Standard Multiple Regression

Standard Multiple Regression is used to simultaneously examine the effects of several independent variables on a single dependent variable. Two models of regression analysis were run. The first, examines the main effect of the individual predictors on environmental performance (dependent variable) and the second, examines the main effect of individual predictors on environmental performance, where environmental management control system acting as a package<sup>74</sup>.

The first model is as follows:

$$\text{ENVPERF (Y)} = \alpha + \beta_1\text{ENVMGMT} + \beta_2\text{INTERACTIVE} + \beta_3\text{BUDGET} + \beta_4\text{EIS} \\ + \beta_5\text{CULTURE} + \beta_6\text{SIZE} + \beta_7\text{STRUCTURE} + \beta_8\text{CHAIN} + \varepsilon$$

While, the second model is:

$$\text{ENVPERF (Y)} = \alpha + \beta_1\text{ENVMGMT} + \beta_2\text{EMCS} + \beta_3\text{SIZE} + \beta_4\text{STRUCTURE} + \\ \beta_5\text{CHAIN} + \varepsilon$$

---

<sup>74</sup> Package of environmental management control system (EMCS) is combinations of multiple environmental management control system elements. For example in this study, package of EMCS is combination of INTERACTIVE, BUDGET, EIS and CULTURE. The possible explanation this thesis uses a package of environmental management control systems is because rather than simply describing the role of specific control system, it was considered of interest to describe the role of overall environmental management control systems on environmental performance.

Where:

$\alpha$	=	Constant
ENVMGT	=	Environmental management practice
INTERACTIVE	=	Interactive control system
BUDGET	=	Budgeting control system
EIS	=	Environmental information system
CULTURE	=	Culture control system
EMCS	=	Environmental management control system
SIZE	=	Natural log size
STRUCTURE	=	Hotel structure
CHAIN	=	Chain Affiliation
ENVPERF	=	Environmental Performance
$\varepsilon$	=	Error term

A summary of the regression results of the individual predictors<sup>75</sup> on environmental performance for both models are presented in Table 6.10 below.

<sup>75</sup> As previously discussed, the measurements of each predictor are as follows:

Predictors	Label	Measurement
ENVMGT	Environmental management practice	5-point Likert Scale
INTERACTIVE	Interactive control system	5-point Likert Scale
BUDGET	Budgeting control system	5-point Likert Scale
EIS	Environmental information system	5-point Likert Scale
CULTURE	Cultural control system	1-100 point of scale (change to 5-point Likert Scale)
SIZE	Natural log hotel size	Number of rooms
STRUCTURE	Hotel structure	5-point Likert Scale
CHAIN	Chain affiliation	Dummy (1=Chain, 0= No chain)
ENVPERF	Environmental performance	5-point Likert Scale

Table 6.10:

**A summary of Standard Multiple Regression Analysis to Test the Main Effect of the Individual Predictors on Environmental Performance**

Variables	Model 1	Model 2
	Coefficient ( <i>t-value</i> )	Coefficient ( <i>t-value</i> )
Constant	9.076 (1.710)	7.501 (1.464)
ENVMGT	-0.010 (-0.252)	-0.046 (-1.387)
INTERACTIVE	-0.081 (-1.116)	-
BUDGET	0.140 (2.340)*	-
EIS	-0.093 (-0.840)	-
CULTURE	0.062 (0.771)	-
EMCS		0.033 (1.256)
SIZE	4.597 (1.747)	4.935 (1.910)
STRUCTURE	0.698 (4.453)**	0.591 (4.522)**
CHAIN	0.642 (0.454)	1.053 (0.736)
F statistic	9.255 ( <i>p</i> =0.000)	12.967 ( <i>p</i> =0.000)
R <sup>2</sup>	0.405	0.371

**Notes:**

The value of the t-statistic is given in parenthesis below the coefficient estimates where

*\*/\*\* indicates statistical significant at  $p < 0.05$  /  $p < 0.001$*

Table 6.10 shows that 40.5 percent ( $R^2 = 0.405$ ) of the level of environmental performance in Model 1 is explained by the independent variables. The  $R^2$  was statistically significant with  $F = 9.255$  and  $p < 0.001$ . The analysis also shows that among each of the environmental management control system elements, BUDGET is the only variable which provides significant explanatory power. On the other hand, STRUCTURE has coefficient which is significantly greater than zero which suggesting that STRUCTURE makes a strongest contribution to the explaining environmental performance.

Results in Model 2 are similar to the results in Model 1. The result shows that 37.1 percent ( $R^2 = 0.371$ ) of environmental performance is explained by the explanatory variables. The  $R^2$  was statistically significant with  $F = 12.967$  and  $p < 0.001$ . STRUCTURE was again found to be statistically significant contribution to explaining environmental performance. The other variables such as ENVMGMT, EMCS, SIZE and CHAIN respectively, were found not statistically significant in explaining environmental performance.

In order to examine the impact of each control variable and to confirm the robustness and sensitivity of the model, the Dropping Method as suggested by Hair et al. (1998) can be used to discard control variables which do not appear to have explanatory power to environmental performance. Based on the model in Table 6.10, CHAIN which has lowest association is discarded first, and then, followed by SIZE, respectively. STRUCTURE is not discarded since it shows a significant explanatory power to environmental performance for each test.

**Table 6.11:**  
**A summary of Standard Multiple Regression Analysis to Test the Main Effect of**  
**the Individual Predictors on Environmental Performance (after dropping**  
**CHAIN and SIZE)**

Variables	Model 1 (from Table 6.10)	Model 1 minus CHAIN	Model 1 minus CHAIN and SIZE
	Coefficient ( <i>t-value</i> )	Coefficient ( <i>t-value</i> )	Coefficient ( <i>t-value</i> )
Constant	9.076 (1.710)	8.070 (1.679)	17.028 (7.791)**
ENVMGMT	-0.010 (-0.252)	-0.005 (-0.142)	0.044 (1.488)
INTERACTIVE	-0.081 (-1.116)	-0.081 (-1.126)	-0.084 (-1.149)
BUDGET	0.140 (2.340)*	2.452 (0.144)*	0.169 (2.886)**
EIS	-0.093 (-0.840)	-0.096 (-0.876)	-0.128 (1.160)
CULTURE	0.062 (0.771)	0.061 (0.763)	0.021 (0.263)
SIZE	4.597 (1.747)	5.029 (2.085)*	-
STRUCTURE	0.698 (4.453)**	0.699 (4.476)**	0.638 (4.099)**
CHAIN	0.642 (0.454)	-	-
F statistic for dropping the variable(s) <sup>76</sup>		0.2215	2.426
R <sup>2</sup>	0.405	0.403	0.380

**Notes:**

The value of the t-statistic is given in parenthesis below the coefficient estimates where

*\*\* indicates statistical significant at  $p < 0.05$  /  $p < 0.001$*

<sup>76</sup> Following Asimakopulos and Hodgkinson (2001), F statistic for dropping the variable(s) is calculated as follows:

$$F = \frac{[SSE(\text{restricted}) - SSE(\text{unrestricted})]/R}{(SSE(\text{unrestricted})/(N-K))}$$

where:

- SSE (restricted) = the error sum of squares in the restricted equations
- SSE (unrestricted) = the error sum of squares in the unrestricted equations
- R = the number of restriction
- N = the number of observation
- K = the number of regressors in the unrestricted equations

Table 6.11 shows the result of Standard Multiple Regression analysis without variable CHAIN and SIZE. The standard coefficient value (Beta) for each variable does not change much. Accordingly, without CHAIN, direction of relationship and significant level for each variable on environmental performance does not affected except for SIZE. The significant level of SIZE has changed from non-significant to significant but the direction of its relationship with environmental performance is similar to the original model. The F-statistic (for Model 1 minus CHAIN) suggests that dropping CHAIN was not significantly different to the Model 1 where explanatory power only dropped to 0.403.

After discarding both CHAIN and SIZE, there is a change in significant level and direction of relationship for two variables. The direction of coefficient of environmental management practice (ENVMGT) changes from negative to positive relationship with environmental performance. While, the level of significance for BUDGET increase from  $p < 0.05$  to  $p < 0.001$ , but the direction of coefficient remains positive.

From this statistical result shows that the variable SIZE has a significant impact to the robustness and sensitivity of the original model compared to CHAIN when it can influence the significance level and direction of the relationship for several variables. The F-statistic in Table 6.11 (Model 1 minus CHAIN and SIZE) suggests that dropping SIZE does not add any explanatory power where it was reduced to 0.380. Therefore, it is worthwhile retaining the variable SIZE in the model, rather than dropping it as it will lower the explanatory power.

### **6.5.2.1 Discussion of Main Effect of the ENVMGMT, EMCS on ENVPERF**

This section is to discuss the main effect of each environmental management control system elements on environmental performance. The main effect of environmental management practice and control variable (size, structure and chain) to environmental performance are also discussed in this section.

#### **a) Environmental management control system (EMCS)**

The result in Table 6.10 highlights that the environmental management control system (EMCS) has an insignificant effect on environmental performance. This result reveals that hotels, which extensively use environmental management control system to carry out environmental management does not necessarily, improve their environmental performance. This finding suggests that the level of environmental performance does not depend on whether or not hotels use environmental management control systems extensively.

In order to support the rejection of the hypothesis H2, independent T-test was conducted. This analysis is to test whether there is a significant difference in the mean of the environmental performance for hotels that extensively use an environmental management control system and those who do not use. The result indicates that there was an insignificant difference in environmental performance ( $t = -1.132$  at  $p > 0.05$ ) between the two groups of hotels. This result suggests that regardless of whether hotels use an environmental management control system extensively or not, environmental performance will not be affected.



This study also uses cross tabulation analysis in order to confirm whether the use of an environmental management control system influences environmental performance. Table 6.12 shows that of 61 sampled hotels that do not extensively use an environmental management control system, 36 hotels achieve an environmental performance better than the median. Similarly, of 63 hotels that extensively use an environmental management control system, 35 hotels achieve an environmental performance that is better than the median. This result again suggests that the sampled hotels' environmental performance is not influenced by the use of an environmental management control system.

**Table 6.12:**  
**Cross-Tabulation between ENVPERF and EMCS**

Environmental performance <sup>77</sup>	Environmental management control system <sup>78</sup>		Total
	Not/less extensively use (0)	More/Extensively use (1)	
Less than median (0)	25 (41%)	28 (44.4%)	53
Better than median (1)	36 (59%)	35 (55.6%)	71
Total	61	63	124

*Chi-Square test*

*Value = 2.084*

*Sig. = 0.149 (p>0.05)*

<sup>77</sup> and <sup>78</sup> the environmental performance and environmental management control system are splitting at median level as suggested by Otley and Bisbe (2004).

Therefore, the results confirm that the hypothesis which proposed that there will be a positive and direct relationship between the use of an environmental management control system and environmental performance in the hotel sector is not supported. Having the insignificant result for the environmental management control system, each of the elements reflecting the use of an environmental management control elements will be tested to determine whether they contribute to environmental performance as discussed in the next section below.

**b) Interactive Control System (INTERACTIVE)**

The results in Table 6.10 indicates that an interactive control system does not have direct significant influence on environmental performance and thus does not support the hypothesis H2a that there will be a positive and direct relationship between an extensively use of an interactive control system and environmental performance.

Table 6.13 shows that, of 66 sampled hotels that do not use extensively an interactive control system, only 23 (34.8%) hotels achieve higher than median environmental performance. Similarly, of 55 sampled hotels that extensively use an interactive control system to manage their environmental management practice, only 19 hotels (34.5%) hotels achieve higher than median environmental performance. The Chi-Square value indicates that the use of an interactive control system does not influence environmental performance.

**Table 6.13:**  
**Cross-tabulation between ENVPERF and INTERACTIVE**

Environmental performance	Interactive control system		Total
	Not/less extensively use (0)	More/Extensively use (1)	
Less than median (0)	43 (65.2%)	36 (65.5%)	79
Better than median (1)	23 (34.8%)	19 (34.5%)	42
Total	66	55	121**

*Chi-Square test*                      *Value = 2.056*                      *Sig. = 0.143 (p>0.05)*

*\*\*Note: Missing value = 3 cases*

This analysis reveals that hotels who use an interactive control system are more likely involving top management and employees, but does not sufficient to assist the hotels in achieving environmental performance. This result suggests that the level of environmental performance does not only depend on whether or not top management and employee involve in environmental management activities. In other words, they need another factor to facilitate them to gain a success in environmental performance such as good reward systems.

This finding contradicts from the previous literature, such as Baba (2004). Baba (2004) suggested that personal involvement from top management and a high commitment from employees will help firm to increase their environmental performance. The findings from the current study may differ firstly due to the industry sector. Baba (2004) examined the relationship at the manufacturing sector whereas this study uses a hotel sector and secondly, because environmental issues

may be at earlier stage in the Malaysian industry sector, in general, and in hotel sector, in particular.

Further clarification of this issue is obtained from the interview survey. Most of the respondents did not appear to know of any incentives, efforts or programmes which were offered by the government and associations related to the hotel sector such as the Malaysian Hotel Association (MAH). Thus, the contradictory results may be caused by a lack of knowledge or a lack of personal motivation towards environmental management activities. Surprisingly, some of the respondents were not aware that ISO 14001 is one of the certificates that recognise their work. According to one respondent;

*'I am actually not realising the ISO for environment. What I know the ISO is just focusing on the quality such as quality, facilities and rooms. That is why we have a 'quality day ceremony' to grant and give award to the very best hotel in Malaysia' (Respondent 3)<sup>79</sup>.*

Therefore, the findings suggest that environmental performance does not differ whether or not the top management are personally involved in environmental management activities.

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<sup>79</sup> Respondents are coding as respondent 1 to respondent 10 to identify the answers given.

**c) Environmental Budgeting System (BUDGET)**

Table 6.10 supports the hypothesis H2b which was said that there will be a positive and direct relationship between an extensive use of environmental budgeting and environmental performance. The analysis shows that there is a positive significant direct influence of the environmental budgeting system on environmental performance, at  $p < 0.05$ .

A positive sign in the relationship means that if hotels keep records of environmental costs, revenue and investment in hotels' budgeting system properly, hotels can manage their environmental management activities and thus, it appears will lead to successful environmental performance. This result suggests that it is likely that the more hotels make an effort to integrate environmental issues into budgeting, the better their environmental performance will be.

In order to support the above argument, the cross tabulation between environmental performance and budgeting control system is carried out. Splitting at the median level for both variables, Table 6.14 shows that when the hotels extensively use a budgeting control system to manage their environmental management practice, their environmental performance is likely to be higher. This argument is supported when 32 of 47 of the sampled hotels that extensively use a budgeting control system having higher than median environmental performance.

**Table 6.14:**  
**Cross-Tabulation between ENVPERF and BUDGET**

Environmental performance	Budgeting control system		Total
	Not/less extensively use (0)	More/Extensively use (1)	
Less than median (0)	49 (68.2%)	15 (31.9%)	64
Better than median (1)	25 (33.8%)	32 (68.1%)	57
Total	66	47	121**

*Chi-Square test*                      *Value = 12.231*                      *Sig. = 0.000 (p<0.05)*

**\*\*Note:** Missing value = 3 cases

Therefore, this result statistically supports the argument that there is a positive and direct relationship between environmental budgeting control system and environmental performance.

#### **d) Environmental Information System**

Table 6.10 also suggests that the use of an environmental information system, which is proxied by the evidence of environmental auditing and accounting, does not significantly influence environmental performance. This analysis does not support hypothesis H2c which proposed that there will be a positive and direct relationship between the extensive use of an environmental information system and environmental performance in the hotel sector. Neither does the environmental information system have any relationship with environmental performance, as shown in table 6.6.

To support the above argument, Table 6.15 shows that hotels in the sample that use an environmental information system more extensively than the median to manage

their environmental management practice do not have significantly higher environmental performance.

**Table 6.15:**  
**Cross-Tabulation between ENVPERF and EIS**

Environmental performance	Environmental information system		Total
	Not/less extensively use (0)	More/Extensively use (1)	
Less than median (0)	32 (52.5%)	30 (49.2%)	62
Better than median (1)	29 (47.5%)	31 (50.8%)	60
Total	61	61	122**

*Chi-Square test*

*Value = 0.033*

*Sig. = 0.856 (p>0.05)*

*\*\*Note: Missing value = 2 cases*

Most of the respondents agreed that the environmental audit is important in seeking the environmental information and that it was required to comply with regulations. They argued that environmental audit and reporting was a vital complement to other internal audits. The respondents also explained that, even though they agreed that this environmental information system is important for them to keep track of the relevant environmental information, due to the fact that such system is new in Malaysia, the possibility that hotel sector generally did not apply the tools is high. As quoted directly from one of the respondents;

*'I think we employ all the tools but not comprehensively because it is new and need full information from our top management. If we practice it properly, I am sure the system will contribute to the overall performance' (respondent 2)*

Some of the hotels applied an auditing and accounting system in general but did not focus on environmental issues. Therefore, this finding suggests that there will be little difference in the environmental performance whether or not the hotels apply and use an environmental information system.

**d) Cultural Control System (CULTURE)**

It was postulated in hypothesis H2d that there will be a positive and direct relationship between environmental culture and environmental performance in the hotel sector. However, this was not supported as shown in Table 6.10.

In order to provide further evidence, Table 6.16 shows that just over half of the sampled hotels in Malaysia employ control dominant value in their firm culture. Based on previous literature, for example, Henri (2006), control-type of culture is more stringent and is possibly difficult to change and adapt a new system. Table 6.16 reveals the insignificant relationship between the types of culture and environmental performance.

**Table 6.16:**

**Cross-tabulation between ENVPERF and CULTURE**

Environmental performance	Hotel's environmental culture		Total
	Control dominant value(0)	Flexibility dominant value (1)	
Less than median (0)	38 (59.4%)	26 (43.3%)	64
Better than median (1)	26 (40.6%)	34 (56.7%)	60
Total	64	60	124

*Chi-Square test*

*Value = 2.581*

*Sig. = 0.108 (p>0.05)*



Therefore, the statement which postulates that there is a positive and direct relationship between environmental culture and environmental performance cannot be accepted.

The respondents from the interview session clarify that the insignificant result regarding such relationship was possibly because environmental issues are new in the Malaysian hotel sector and suggest environmental culture will come naturally through experience. As one respondent quoted:

*'Culture comes as a natural process. When we share knowledge, beliefs and experiences, the hotels structure will change. However, the environmental issues are new in our hotel. I don't think we have a strong hotel environmental culture. As you know, culture would take longer to build'* (Respondent 4).

Therefore, these results suggest that there is no significant direct relationship between environmental performance and a hotels' environmental culture. Hotels that employ flexibility-type of culture will possibly better environmental performance.

#### **e) Environmental Management Practice (ENVMGT)**

Even though there is a relationship between environmental management practice and environmental performance as shown in Table 6.6, Table 6.10 shows that environmental management practice does not significantly contribute to the environmental performance. The finding does not support the hypothesis H3 which

proposed that there is a positive and direct relationship between environmental management practice and environmental performance.

In order to support the argument above, Table 6.17 shows that for the hotels giving a high commitment to environmental management practice, only 28 hotels from 59 sampled hotels achieved a higher environmental performance than the median. While for the hotels that give a low commitment to environmental management practice, only 32 hotels show environmental performance greater than median. These results suggest that environmental performance is not influenced by the level of commitment to environmental management practice as evidenced by an insignificant Chi-Square.

**Table 6.17:**  
**Cross-Tabulation between ENVPERF and ENVMGT**

Environmental performance	Environmental management practice		Total
	Low commitment (0)	High commitment (1)	
Less than median (0)	33 (50.8%)	31 (52.5%)	64
Better than median (1)	32 (49.2%)	28 (47.5%)	60
Total	65	59	124

*Chi-Square test*

*Value = 0.039*

*Sig. = 0.844 (p > 0.05)*

However, referring back to Table 6.2, there is a difference among the group of the hotels in implementing environmental management practice where highly-committed hotels are likely from the large hotel group. Thus, this result suggests that the environmental management practice may be can contribute to environmental performance if there were other factors that influence their relationship, such as the management control system or the size of the hotel.

The respondents to the interview survey suggested that reasons why hotels environmental management practice did not contribute to better environmental performance was that hotels only practise the activities which are related to pollution prevention, and not to the other environmental-related issues. The hotels in the sample appear to engage in pollution prevention techniques including techniques for:

- Reducing environmental pollution
- Conducting recycling programs
- Protecting biodiversity
- Educating guest, public or staff about preventing environment from being polluted
- Reducing energy consumption
- Monitoring waste production

The question asked the respondents how serious their hotel was in implementing environmental management practice. The answer should in part relate to the question as to whether they were aware of any problems in order for them to know the right activities to improve their hotel environmental performance.

The findings from the above analyses suggest that environmental performance does not differ whether or not hotels practice environmental management activities. The finding also suggests that there may be other factors which may influence the relationship.

f) **Hotel size (SIZE)**

Table 6.10 shows that hotel size which was proxied by the number of guest room does not influence environmental performance. This result does not support the hypothesis that there is a direct relationship between larger hotel size and environmental performance. However, Table 6.11 indicates that if CHAIN was dropped from the model, SIZE was found to significantly influence environmental performance. The finding reveals that environmental performance is similar, statistically, for large size hotels and medium size hotels only if chain affiliation is considered in the model. In order to confirm the result, the Independent T-test is conducted to compare the environmental performance score for large size hotel and medium size hotel. Table 6.18 shows that there was no significant difference in score for large size hotel at  $p = 0.133$  ( $p > 0.05$ ). Therefore, the environmental performance does not appear to differ depending on hotel size.

**Table 6.18**  
**Independent T-Test for ENVPERF and SIZE**

F-statistic	Sig.	T value <sup>80</sup>	Sig. (2-tailed)
1.546	0.216	-1.512	0.133

<sup>80</sup> Following Hair et al. (1998), T-statistic is calculated as follows:

$$t\text{-statistic} = \frac{\mu_1 - \mu_2}{SE_{\mu_1\mu_2}}$$

Where  $\mu_1$  = mean of group 1

$\mu_2$  = mean of group 2

$SE_{\mu_1\mu_2}$  = standard error of the difference in group means

**g) Hotel Structure (STRUCTURE)**

The result in Table 6.10 reveals that hotel structure has a significant effect on environmental performance. Table 6.11 also indicates that when the variables CHAIN and SIZE dropped from the model, STRUCTURE remains significantly to influence environmental performance. This result supports the hypothesis that there is a direct and positive relationship between hotel structure and environmental performance. The result suggests that environmental performance differs when hotels deploy different types of firm structure. In sum, the hotels that engage in an organic type of structure are likely to have different level of environmental performance compared to the hotels that employ a mechanistic type of structure.

**h) Chain Affiliation (CHAIN)**

The result shown in the Table 6.10 does not support the hypothesis that chain affiliation has a direct effect on environmental performance. However, Table 6.19 shows that there is a significant difference in the score for hotels that have chain affiliation at  $p = 0.002 (<0.05)$ .

**Table 6.19**

**Independent T-Test for ENVPERF and CHAIN**

F-statistic	Sig.	T value	Sig. (2-tailed)
0.504	0.471	-3.140	0.002

While asking the respondents in interviews about the influence of chain affiliation on their hotel, they said, even though the chain encourages them and show the way how to improve their environmental performance; the end point to make a decision is depending upon their own management in the hotel specifically. The chain may influence the performance, but this does not mean that the environmental performance will be better.

### **6.5.3 Hierarchical Multiple Regression**

As this study intends to examine the influence of the environmental management control system on the relationship between environmental management practice and environmental performance, hierarchical multiple regression is used as suggested by many previous researchers, such as Baron and Kenny (1986), Sharma (2002), Bisbe and Otley (2004) and Harrington and Kendall (2006).

#### **6.5.3.1 Direct and Indirect Effect (Mediation Model)**

According to Baron and Kenny (1986), to test for mediation, three regression conditions should be met. First, the independent variable (i.e. environmental management practice) should affect the mediator (i.e. environmental management control systems). Second, the independent variable should have a significant effect with the dependent variable (i.e. environmental performance) and third, the mediator should affect the dependent variable, when controlling for the independent variable.

The linear equations of the relationship mentioned above are:

$$(1) \quad \text{EMCS} = \alpha + \beta_1 \text{ENV MGT} + \varepsilon$$

$$(2) \quad \text{ENV PERF} = \alpha + \beta_1 \text{ENV MGT}_i + \varepsilon$$

$$(3) \quad \text{ENV PERF} = \alpha + \beta_1 \text{ENV MGT} + \beta_2 \text{EMCS}_i + \varepsilon$$

*Where*

$\text{EMCS}_i$  firstly represents the existence of Environmental Management Control System  
secondly, the existence of each of the management control system elements:

- INTERACTIVE = Interactive Control System
- BUDGET = Budgeting Control System
- EIS = Environmental Information System
- CULTURE = Cultural Control System
- ENV MGT = Environmental Management Practice
- ENV PERF = Environmental Performance
- $\varepsilon$  = error term

(1) First requirement

As indicated in Table 6.6, the environmental management practice is correlated to an extensive use of environmental management control system at  $p < 0.01$ . Additionally, correlations between each of the four selected individual control system elements (i.e. INTERACTIVE, BUDGET, EIS, CULTURE) and environmental management practice was also analysed to test whether variations of hypothesis H1 would hold for each individual environmental management control system. The result in Table 6.6 also indicates that environmental management practice is related to each environmental management control system element at  $p < 0.01$ . Thus, the result

supports the hypothesis proposed in Hypothesis 1a, Hypothesis 1b, Hypothesis 1c and Hypothesis 1d.

The linear regression analysis in Table 6.20 also shows the significant effect of environmental management practice on the environmental management control system as a whole and each of the elements of the management control system.

**Table 6.20:**

**The Relationship between ENVMGT and EMCS (and Each of Its Elements)**

<b>Pair of variables</b>	<b>R<sup>2</sup></b>	<b>Standardised coefficients (beta)</b>	<b>t</b>	<b>Sig.</b>
Environmental management practice – environmental management control system	0.308	0.555	7.129	0.000
Environmental management practice – interactive control system	0.233	0.483	6.019	0.000
Environmental management practice – environmental budgeting control system	0.091	0.302	3.527	0.001
Environmental management practice – environmental information system	0.356	0.597	8.145	0.000
Environmental management practice – cultural control system	0.055	0.234	2.654	0.009

The result shows that environmental management practice explained a significant amount of the variance of the environmental management control system and of each of the elements of the environmental management control system. Baron and Kenny (1986) suggested that if the independent variable is assumed to affect mediator, these two variables should be correlated. Thus, the first requirement for mediation was supported.



(2) Second requirement

The second requirement for the mediation effect is that environmental management practice must significantly affect environmental performance. As Baron and Kenny (1986) suggested that the independent variable must be related significantly to the dependent variable.

As shown in Table 6.6, environmental management practice and environmental performance are significantly correlated. The regression result in which environmental performance was regressed on environmental management practice is shown in table 6.21, Model 1.

As indicated in Table 6.21 environmental management practice was significantly related to environmental performance in Model 1 ( $R^2 = 0.068$ , Beta = 0.261 and  $p < 0.001$ ). This result suggests that environmental management practice was a significant indicator to the environmental performance. Thus the second requirement for mediation was confirmed.

Table 6.21:

## Hierarchical Multiple Regressions: Environmental Performance

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Environmental management practice	0.261** (0.025)	-0.013 (0.028)	0.032 (0.026)	0.131 (0.024)	0.331** (0.031)	0.232 (0.025)
<b>Environmental management control system</b>		0.493** (0.022)				
<b>Interactive control system</b>			0.473** (0.040)			
<b>Budgeting control system</b>				0.429** (0.046)		
Environmental information system					-0.118 (0.122)	
Environmental culture						0.124 (0.085)
R <sup>2</sup>	0.068**	0.236**	0.239**	0.235**	0.077	0.082
R <sup>2</sup> Change	0.068	0.168	0.172	0.167	0.009	0.015
F	8.301**	17.473**	18.569**	18.118**	4.950	5.435
<b>Environmental management control system</b>		0.493** (0.022)				
<b>Interactive control system</b>			0.473** (0.040)			
<b>Budgeting control system</b>				0.429** (0.046)		
Environmental management practice		-0.013 (0.028)	0.032 (0.026)	0.131 (0.024)		
R <sup>2</sup>		0.236	0.239	0.235		
R <sup>2</sup> Change		0.000	0.001	0.016		
F		17.473	18.569	18.118		

\* Significant  $p < 0.05$ , \*\* Significant  $p < 0.001$

Figure in bracket is a standard error.

All betas are standardised<sup>81</sup>.

<sup>81</sup> Standardised beta was used by Bisbe and Otley (2004) and Sharma (2002) in their studies to present the mediating and moderating effects. According to Pallant (2004), standardised means these values for each different variable have been converted to the same scale so comparison is easier to make. However, in order to construct a regression equation, an unstandardised coefficient should be used.

## (3) Third requirement

To demonstrate mediation, it must be shown that the environmental management control system is related to environmental performance, when environmental performance is regressed on both environmental management practice and the environmental management control system. Refer to Table 6.21, Model 2 shows that the environmental management control system is significantly related to environmental performance. The standardised coefficient (beta) provides evidence of a significant direct link between environmental management control system and environmental performance, while controlling for environmental management practice (Beta=0.493 at  $p=0.000<0.05$ ). Thus, the third requirement for mediation is supported.

However, when considering each element of the environmental management control system, only the interactive control system (Model 3) and the environmental budgeting control system (Model 4) show a significant effect on environmental performance. As shown in Table 6.21, the standardised coefficient (beta) for Model 3 and Model 4 is 0.473 and 0.429, respectively. Both of them are significant at  $p<0.001$ . The results indicate that an interactive control system ( $R^2$  change<sup>82</sup> = 0.172 at  $p<0.001$ ) and an environmental budgeting system ( $R^2$  change = 0.167 at  $p<0.001$ ) explained a significant amount of incremental variance in environmental performance, above that explained by environmental management practice alone. Therefore, the

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<sup>82</sup>  $R^2$  change (interactive) =  $R^2$  Interactive -  $R^2$  environmental management practice  
= 0.250 - 0.070 = 0.180

third requirement for mediation effect was supported for an interactive control system and a budgeting control system.

In order to reach the perfect mediation, the independent variables should have no significant effect on the dependent variable, when the mediator is controlled for (Saks, 1995; Baron and Kenny, 1986). Therefore, the second test is done to Model 2, Model 3 and Model 4. In Model 2, by entering environmental management control system (EMCS) first before environmental management practice, the variance in environmental performance explained by environmental management practice declines to non-significant level. While, the second test for Model 3 presents the regression results when entering interactive control system before environmental management practice. By controlling for the interactive control system, the variance in environmental performance, explained by environmental management practice declined to non-significant level ( $R^2$  change = 0.001 at  $p > 0.001$ ). Similarly, in Model 4, the environmental budgeting was entered before environmental management practice. By controlling for the environmental budgeting system, the  $R^2$  change is equal to 0.016 at  $p > 0.001$ . There is a decline from a significant to a non-significant effect of the environmental budgeting system to environmental performance.

In sum, the results suggest that there is complete mediation for environmental management control system as a package, interactive control system and budgeting control system on the relationship between environmental management practice and environmental performance. The results also support the hypothesis H4a and H4b which proposed that there is a positive indirect relationship between environmental management practice and environmental performance through the acting of extensive

use of interactive control system (H4a) and budgeting control system (H4b) in the hotel sector. On the other hand, the result supports the hypothesis 4 but in opposite direction. Table 6.22 summarises the result analysis from the Table 6.6 and Table 6.21 in order to highlight the indirect effect of the environmental management control system on environmental performance.

**Table 6.22:**

**Direct and Indirect Effects of ENVMGT on ENVPERF acting through EMCS  
and Each of Its Elements**

Control system	Linkage	Direct <sup>83</sup>	Indirect	Total (observed zero-order correlation)	p-value
EMCS	ENVMGT/EMCS	0.555	NA	0.555	Sig.**
	ENVMGT/ENVPERF	-0.013	0.274	0.261	Sig.**
	EMCS/ENVPERF	0.493	<b>-0.007**</b>	0.486	<b>Sig.**</b>
INTERACTIVE	ENVMGT/INTERACTIVE	0.483	NA	0.483	Sig.**
	ENVMGT/ENVPERF	0.032	0.229	0.261	Sig.**
	INTERACTIVE/ENVPERF	0.473	<b>0.015**</b>	0.488	<b>Sig.**</b>
BUDGET	ENVMGT/BUDGET	0.302	NA	0.302	Sig.**
	ENVMGT/ENVPERF	0.131	0.130	0.261	Sig.**
	BUDGET/ENVPERF	0.429	<b>0.039**</b>	0.468	<b>Sig.**</b>
EIS	ENVMGT/EIS	0.597	NA	0.597	Sig.**
	ENVMGT/ENVPERF	0.331	0.007	0.261	Sig.**
	EIS/ENVPERF	-0.118	0.279	0.080	n.s
CULTURE	ENVMGT/CULTURE	0.234	NA	0.234	Sig.**
	ENVMGT/ENVPERF	0.232	0.029	0.261	Sig.**
	CULTURE/ENVPERF	0.124	0.054	0.178	n.s

NA = Not applicable since this is a direct effect.

n.s = Not significant

\*\*Significant at  $p < 0.001$

<sup>83</sup> If ENVMGT = 1

EMCS = 2

ENVPERF = 3

Therefore,  $P_{21} = r_{21}$

$$P_{31} = \beta_{31.2} = (r_{31} - r_{32}r_{12}) / (1 - r_{21}^2)$$

$$P_{32} = \beta_{32.1} = (r_{32} - r_{31}r_{12}) / (1 - r_{21}^2)$$

### 6.5.3.2 Moderating Effect

The moderating effect happens when the level of the third variable (in this case the environmental management control system) influences or affects the degree of the relationship between two variables (in this case the environmental management practice and the environmental performance).

Baron and Kenny (1986) suggested that in order to test the moderating effect, moderated hierarchical multiple regression analysis should be used. This suggestion was supported by Bisbe and Otley (2004) and Harrington and Kendall (2006) who argue that the moderated multiple regression analysis allows the relationship between the independent variables and dependent variables count on the other independent variables (i.e. moderator).

The hypothesis proposed that with the more extensive use of the:

- environmental management control system (H5)
- interactive control system (H5a)
- environmental budgeting control system (H5b)
- environmental information system (H5c)
- cultural control system (H5d)

It is expected that the greater the effect of environmental management practice or strategy on environmental performance in the hotel sector would be. This proposal means that by using the environmental management control system or its element, the explanatory power of environmental management practice on environmental performance will be enhanced.

This proposal can be tested using the formulation of the moderation model as below:

$$(4) \quad \text{ENVPERF} = \alpha + \beta_1 \text{ENVMGTT} + \beta_2 \text{EMCS}_i + \beta_3 \text{ENVMGTT} * \text{EMCS}_i + \varepsilon$$

Where

EMCS represents firstly the environmental management control system and secondly of each of the environmental management control system elements:

- INTERACTIVE = Interactive control system
- BUDGET = Budgeting control system
- EIS = Environmental information system
- CULTURE = Cultural control system
- ENVMGTT\*EMCS<sub>i</sub> = Interaction term

The results of the moderated regression analysis are presented in Table 6.23. Test 1 refers to the summated concept of environmental management control system. Test 2 up to test 5 refer to each of the environmental management control system elements; interactive control system, environmental budgeting system, environmental information system and environmental culture.

As shown in Table 6.23, the results support the hypothesis that proposed the more extensive the use of the environmental information system (H5c) and cultural control system (H5d), the greater would be the effect of environmental management practice on environmental performance.

Table 6.23:

## Moderated Multiple Regression Analysis: Environmental Performance

Variable	Model 1	Model 2	Model 3
<b>Test 1</b>			
ENVMGT	0.261*** (0.025)	-0.013 (0.028)	-0.308 (0.076)
EMCS		0.493*** (0.022)	0.265 (0.048)
ENVMGT*EMCS			0.472 (0.001)
R2	0.068***	0.236***	0.245
R2 Change		0.168	0.009
F Change	<b>8.301***</b>	<b>17.473***</b>	1.361
<b>Test 2</b>			
ENVMGT	0.261*** (0.025)	0.032 (0.026)	-0.261 (0.061)
INTERACTIVE		0.473*** (0.040)	0.191 (0.093)
ENVMGT*INTERACTIVE			0.510 (0.001)
R2	0.068***	0.239***	0.253
R2 Change		0.172	0.014
F Change	<b>8.301***</b>	<b>26.607***</b>	2.210
<b>Test 3</b>			
ENVMGT	0.261*** (0.025)	0.131 (0.024)	-0.003 (0.058)
BUDGET		0.429*** (0.046)	0.295 (0.112)
ENVMGT*BUDGET			0.223 (0.002)
R2	0.068***	0.235	0.238***
R2 Change		0.167	0.003
F Change	<b>8.301***</b>	<b>25.766***</b>	0.507
<b>Test 4</b>			
ENVMGT	0.261*** (0.025)	0.331** (0.031)	-0.651 (0.113)
EIS		-0.118 (0.1221)	-0.615** (0.249)
ENVMGT*EIS			<b>1.357* (0.004)</b>
R2	0.068***	0.077	0.124**
R2 Change		0.009	0.047
F Change	<b>8.301***</b>	1.150	<b>6.363**</b>
<b>Test 5</b>			
ENVMGT	0.261*** (0.025)	0.232* (0.025)	0.205* (0.025)
CULTURE		0.124 (0.006)	0.603* (0.212)
ENVMGT*CULTURE			<b>-0.514* (0.003)</b>
R2	0.068***	0.067**	0.123
R2 Change		0.015	0.040
F Change	<b>8.301***</b>	1.919	<b>5.486*</b>

\* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$  All betas are standardised.

Figure in bracket indicates the standard errors

**Bold figure highlights the significant of the relationship.**



The result of Test 1 shows that the R square of the model increases slightly from 0.236 without interaction to 0.245 with the interaction term. The interaction coefficient (standardised beta) of the environmental management control system (EMCS) is not significant ( $R^2$  Change = 0.009,  $p > 0.05$ )

The analysis was replicated for each of the individual environmental management control system chosen in this study. The result of test 2 displayed in Table 6.23 shows that when using the interactive control system as a moderator variable, the  $R^2 = 0.253$  but the interaction coefficient is not significant.

Table 6.23 also reveals that when using the environmental budgeting control system as a moderator, the interaction coefficient is also not significant. In test 3, the  $R^2 = 0.238$  and add only 0.3 percent to explanatory power to the model. The increasing is only has a little effect to explain the variance in environmental performance.

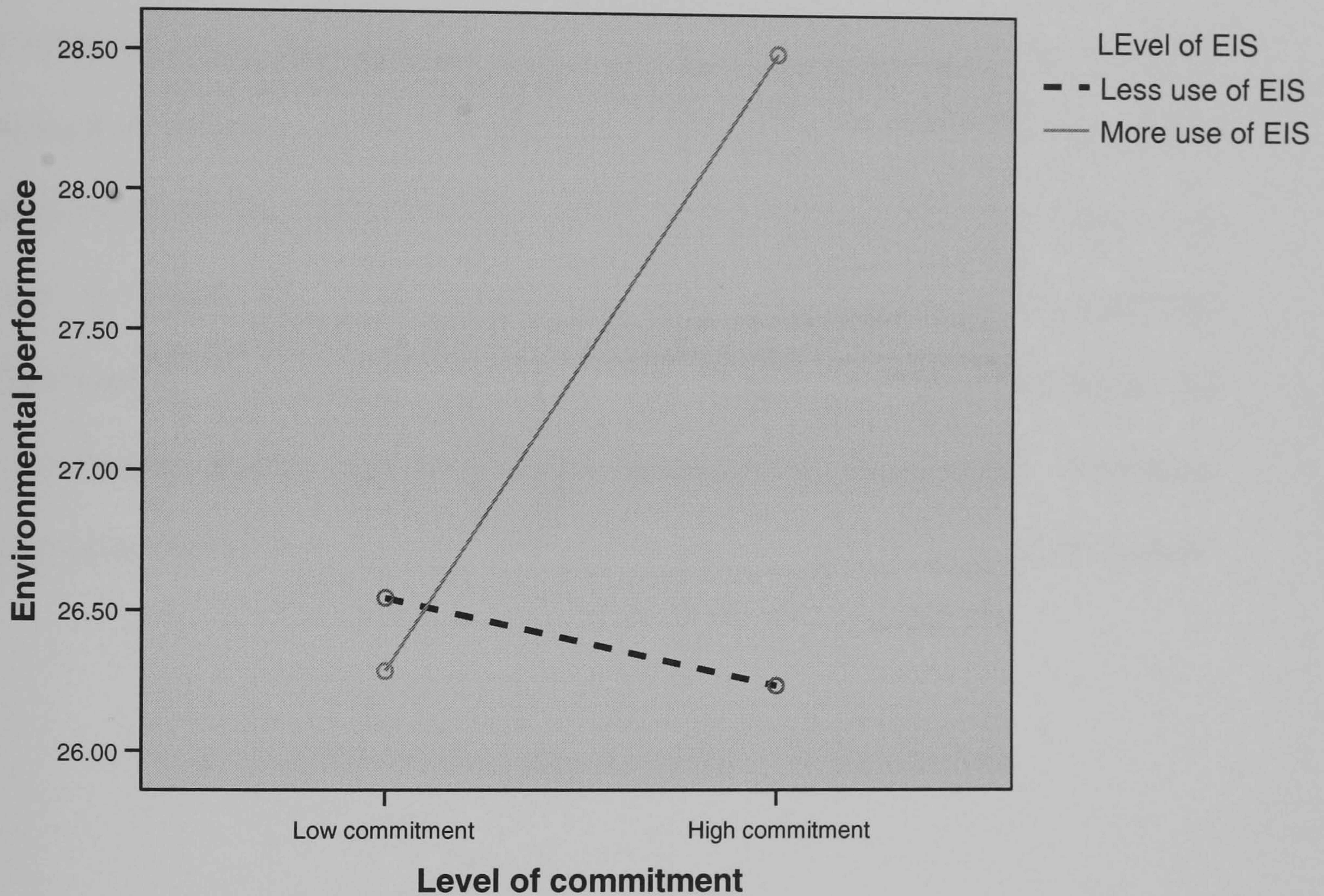
Test 4 highlights that when using an environmental information system as a moderator, the interaction coefficient is positive and significant at  $p < 0.01$ . The  $R^2 = 0.124$  and add 4.7 percent to explanatory power to explain the variance in environmental performance. The result suggests that the extensive use of an environmental information system moderates the relationship between environmental management practice and environmental performance.

By using ANOVA test, the interaction effect can be drawn between the environmental management practice and the environmental performance. The environmental management practice is splitting at median level to group the practice into two, namely a low commitment group and a high commitment group. The level use of environmental information system is also splitting at median level to classify it into two groups, namely less use of EIS and more use of EIS.

Since the interaction coefficient is positive ( $\beta=1.357$ , significant at  $p<0.05$ ), it can suggest that the slope of the line representing the relationship between environmental management practice and environmental performance is significantly higher in hotels that more use environmental information system extensively. Figure 6.2 shows that the interaction effects were substantially stronger for high commitment hotels.

**Figure 6.2:**  
**The Moderating Effect of EIS on the Relationship between**  
**ENVMGT and ENVPERF**

**Interaction between EIS and Environmental Management Practice**



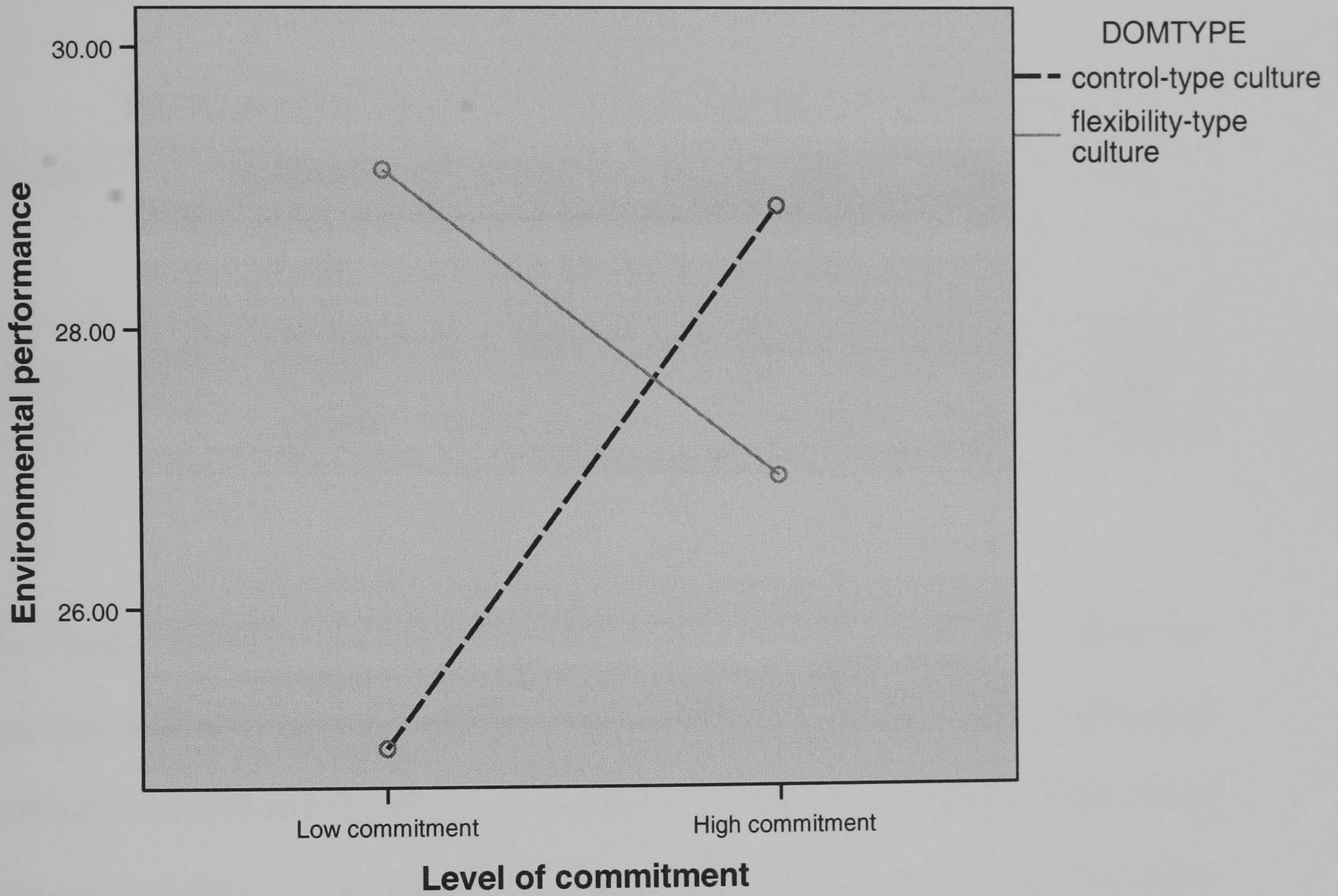
This result suggest that the hotels who give high commitment to environmental management practice and use more environmental information system, the stronger the effect of environmental management practice on the environmental performance. In other words, the extensive use of environmental information system is likely to enhance the impact of environmental management practice on environmental performance, particularly when hotels have a high commitment to practising environmental management activities.

Test 5 in Table 6.23, also highlights that when using cultural control system as a moderator, the interaction coefficient is significant but in negative sign. The  $R^2 = 0.123$  and the interaction term adds 4.0 percent to the explanation power to explain the variation in environmental performance.

By using ANOVA, the interaction effect can be drawn between the environmental management practice and the environmental performance. CULTURE was split at median level into two groups, namely control-type and flexibility-type of culture. As shown in Figure 6.3, when hotels which have low commitment in practising environmental management activities, but engage in flexibility-value in environmental culture, will have higher environmental performance, otherwise, engaging in control-dominant type value, will have lower environmental performance.

**Figure 6.3:**  
**The Moderating Effect of CULTURE on the Relationship Between ENVMGT and ENVPERF**

**Interaction between hotel environmental culture and environmental management practice**



## 6.6 Control Variables and ENVMT

The regression analysis was used to test the relationship between the control variables (hotel size, hotel structure and chain affiliation) and environmental management practice. The result was displayed in Table 6.24 below.

**Table 6.24:**

**The Regression Analysis for control variables and ENVMT**

Variables	Unstandardized Coefficient		Standardised coefficient	t-value	Sig.
	$\beta$	Standard error	Beta		
SIZE	39.587	6.560	0.484	6.034	0.000
STRUCTURE	1.051	0.276	0.240	3.807	0.000
CHAIN	12.169	3.965	0.251	3.069	0.003

The results indicate that the hotel size has a positive significant effect on environmental management practice. Table 6.24 displays that the standardised coefficient is 0.484 and significant at  $p < 0.001$ . Therefore, the hypothesis H6b which proposed that there is a positive relationship between hotel size and environmental management practice is supported.

The result in Table 6.24 also supports the hypothesis H7a which proposed there is a positive relationship between hotel environmental structure and environmental management strategy. The standardised coefficient is 0.240 and significant at  $p < 0.001$ . This result suggests that hotel environmental structure has a significant relationship with the environmental management practice.

As shown in Table 6.24, there is evidence of a relationship between hotel chain affiliation and environmental management practice. As indicated by a standardised coefficient of 0.251 suggesting that hotel chain affiliation does contribute to the commitment of environmental management practice. Therefore, the hypothesis H8 which proposed that there is a relationship between a hotel's chain affiliation and its environmental management practices is supported.

### **6.7 Control variables and EMCS**

The Regression analysis was used to test the relationship between the control variables (hotel size, hotel structure and chain affiliation) and the environmental management control system. The test was also run for each of the management control system elements. The results are displayed in Table 6.25 below.

Table 6.25:

## The Regression Analysis for control variables and EMCS

Variables	Unstandardized Coefficient		Standardised coefficient	t-value	Sig.
	$\beta$	Standard error			
SIZE-EMCS	15.127	8.551	0.145	1.769	0.080
SIZE-INTERACTIVE	6.108	3.562	0.117	1.715	0.089
SIZE-BUDGET	4.008	4.171	0.095	0.961	0.339
SIZE-EIS	5.895	2.265	0.285	2.602	0.010**
SIZE-CULTURE	-1.931	2.808	-0.080	-0.688	0.493
STRUCTURE-EMCS	3.580	0.360	0.641	9.948	0.000***
STRUCTURE-INTERACTIVE	2.143	0.150	0.768	14.294	0.000***
STRUCTURE-BUDGET	1.065	0.176	0.471	6.065	0.000***
STRUCTURE-EIS	0.157	0.095	0.142	1.647	0.102
STRUCTURE-CULTURE	0.195	0.118	0.151	1.648	0.102
CHAIN-EMCS	11.434	5.168	0.185	2.213	0.029*
CHAIN-INTERACTIVE	3.525	2.153	0.114	1.638	0.104
CHAIN-BUDGET	4.669	2.521	0.186	1.852	0.067
CHAIN-EIS	1.395	1.369	0.114	1.019	0.310
CHAIN-CULTURE	1.744	1.697	0.122	1.028	0.306

\*/\*\*/\*\*\* significant at 0.05/0.01/0.001

As shown in Table 6.25, there is no correlation between hotel size (SIZE) and environmental management control system (EMCS). The standardised coefficient is 0.145 at  $p > 0.05$ . Similarly, when examining each of the environmental management control system elements, the result appears to show that all except for an environmental information system (EIS) do not have significant correlation to hotel size. Hotel size has a unique significant contribution to the extensive use of environmental information system (beta = 0.285).



This result supports the hypothesis which proposed that there is a positive relationship between SIZE and EIS. The larger the hotel size, the more the use of environmental information system would be.

Table 6.25 also indicates that hotel structure has a correlation with the use of all the environmental management control system elements except for environmental information system and environmental culture. Thus, the results support the hypothesis H7b which expected that there is a positive and significant relationship between:

- STRUCTURE and INTERACTIVE (beta=0.768)
- STRUCTURE and BUDGET (beta=0.471)

This result suggests that if the hotels have a specialised department to manage environmental issues, such as the Hygiene and Environmental department, and deploy the organic type of structure, the more extensively the hotels use the interactive control system and the environmental budgeting system.

In addition, Table 6.25 shows that chain affiliation has a significant correlation to the overall package of the extensive use of environmental management control system (beta = 0.185,  $p < 0.05$ ) but not to the individual elements of the environmental management control system. This result suggests that chain affiliation is more likely to influence the decision to use an environmental management control system.

## 6.8 Control variables and ENVPERF

With referring back to Table 6.10, only hotel structure has a significant contribution to the environmental performance (beta=0.569,  $p < 0.001$ ). On the other hand, hotel size and chain affiliation do not shown a significant influence to the environmental performance. Hotel structure is also a good indicator of environmental performance as the results of all tests show a consistent significant coefficient to environmental performance.

However, Table 6.11 highlights that when dropping the variable chain affiliation from the model, the structure remain significant to environmental performance and hotel size also appears to be significant to the environmental performance.

## 6.9 Chapter Summary

This chapter presents the findings of the questionnaire and interview-based survey which were derived from the various analyses. The main analysis on the influence of the environmental management control system on the relationship between environmental management practice and environmental performance was obtained from the hierarchical multiple regressions.

From the analyses, several findings can be summarised as below:

- Almost 47.5 percent of the hotels in the sample which engage with environmental management practice show high commitment towards these practices.
- The large size hotels are also more likely to be proactive and have separate departments and special managers to manage the environmental matters.
- Hotels in the sample are likely to employ the control-type of culture and organic-type of hotel structure.
- From the Correlation Analysis (Table 6.6), it was found that the environmental management practice, interactive control system, environmental budgeting control system, cultural control system, hotel size, hotel structure and chain affiliation have a positive relationship with environmental performance.
- From the Multiple Regression Analysis, the budgeting control system and hotel structure seemed to contribute to the environmental performance at  $p < 0.05$  (Table 6.10).
- The analysis also found that there was a positive indirect relationship between environmental management practice and environmental performance through

the extensive use of an environmental management control system (as a package), interactive control system and environmental budgeting system (Table 6.21 and Table 6.22)

- The Analysis of Moderated Hierarchical Multiple Regression found that the more extensive the use of the environmental information system and environmental culture, the greater the effect of environmental management practice on environmental performance would be (Table 6.23).
- Finally, the analysis found that all the control variables such as hotel size, hotel structure and chain affiliation have some contribution to the commitment to practising environmental management activities. However, the hotel structure influences all the management control system elements except for environmental information system and hotel environmental culture. On the other hand, chain does not have a significant contribution to individual element of environmental management control system but contribute to the decision to use environmental management control system as a package.

In conclusion, the summary of the hypotheses testing is shown in the Table 6.26 below:

**Table 6.26:**  
**Summary of the research model findings**

Hypothesis	Relationship	Finding (direction)
<b>Relationship 1: Environmental management practice</b>		
H1	Environmental management control system	<b>Supported (+)</b>
H1a	Interactive control system	<b>Supported (+)</b>
H1b	Environmental budgeting control system	<b>Supported (+)</b>
H1c	Environmental information system	<b>Supported (+)</b>
H1d	Cultural control system	<b>Supported (+)</b>
<b>Relationship 2: Environmental performance</b>		
H2	Environmental management control system	Not supported (+)
H2a	Interactive control system	Not supported (-)
H2b	Environmental budgeting system	<b>Supported (+)</b>
H2c	Environmental information system	Not supported (-)
H2d	Cultural control system	Not supported (+)
<b>Relationship 3: Environmental performance</b>		
H3	Environmental management practice	Not Supported (-)
<b>Relationship 4: Mediating effect</b>		
H4	Environmental management control system	<b>Supported (-)</b>
H4a	Interactive control system	<b>Supported (+)</b>
H4b	Environmental budgeting system	<b>Supported (+)</b>
H4c	Environmental information system	Not supported (+)
H4d	Cultural control system	Not supported (+)
<b>Relationship 5: Moderating effect</b>		
H5	Environmental management control system	Not supported (-)
H5a	Interactive control system	Not supported (+)
H5b	Environmental budgeting system	Not supported (+)
H5c	Environmental information system	<b>Supported (+)</b>
H5d	Cultural control system	<b>Supported (-)</b>
<b>Relationship 6: Hotel size</b>		
H6a	Environmental management control system (Except for EIS)	Not supported (+)
H6b	Environmental management practice	<b>Supported (+)</b>
H6c	Environmental performance	Not supported (+)
<b>Relationship 7: Hotel structure</b>		
H7a	Environmental management practice	<b>Supported (+)</b>
H7b	Environmental management control system (except for CULTURE and EIS)	<b>Supported (+)</b>
H7c	Environmental performance	<b>Supported (+)</b>
<b>Relationship 8: Chain affiliation</b>		
H8a	Environmental management practice	<b>Supported (+)</b>
H8b	Environmental management control system (but all individual element of EMCS do not supported)	<b>Supported (+)</b>
H8c	Environmental performance	Not supported (+)

From the Table 6.26 above, seventeen hypotheses were supported while, on the other hand, thirteen hypotheses were not supported. The results indicate that all the signs of the coefficients for the supportive relationship were as expected except for hypothesis H4 and hypothesis H5d.

In sum, the results of the study have provided insight into some explanatory factors that have significant effects on environmental performance. Furthermore, the results also indicate that not all elements of management control system mediate or moderate the relationship between environmental management practices and environmental performance. An interactive control system and a budgeting control system are likely to mediate the relationship, while an environmental information system and a cultural control system are more likely to act as moderator to the relationship.

The next chapter will discuss the findings of the study in more detail and compare to the relevant literature. Finally, last chapter will conclude the study with the assumptions, limitations, implications and suggestions for future research.

## Discussion and Summary

### 7.1 Introduction

The aim of this study was to examine the influence of the environmental management control system on the relationship between environmental management practice and environmental performance. In order to fulfil the objective of the study, several types of analyses, such as the Pearson Correlation and Multiple Regression Analysis were carried out. In the previous chapter, the results of hypotheses testing and interview responses were reported. As the objective of the interview survey was to explain and clarify the issues raised from the questionnaire results, the analysis of the interviews was presented alongside the postal results where the issues of concern were raised.

Hence, the aim of this chapter is to discuss the findings of the questionnaire survey and interview based study together and these findings are compared to the relevant literatures. The discussion of the questionnaire survey findings is mostly related to hypotheses testing while the discussion of the interview findings is to explain and clarify the issues related to the survey findings. This chapter is organised around the research objectives identified and discussed in Chapter 1.

The interpretation of the findings, the conclusion and limitations of the study and a direction for future research is suggested in the Chapter Eight.

## **7.2 Summary and Discussion of the Research Findings**

The discussion of the research findings is divided into three subsections. First, the discussion is centred on the relationship between environmental management practice, the environmental management control system and environmental performance. The finding on the role played by the environmental management control system on the relationship between practice and performance is also discussed. This addresses the first and second research objectives. The second section discusses current environmental management practice in the Malaysian hotel sector and the awareness of this sector concerning the issues of environmental management practice. This part is to address the third research objective. Finally, the discussion of the role played by the control variables on the relationship is presented.

### **7.2.1 Environmental Management Practice, Environmental Management Control System and Environmental Performance**

In order to facilitate the discussion, the findings are divided into two parts. The first part is a discussion of the main effects of environmental management practice and the environmental management control system on environmental performance and the second part is the mediating and moderating effect of the environmental management control system on environmental performance.



### **7.2.1.1 The Main and Direct Effect**

In order to test the main and direct effect of environmental management practice and the environmental management control system on environmental performance, the Multiple Regression Analysis was used.

#### **7.2.1.1.1 Environmental management control system**

The result discussed in Chapter Six reveals that an extensive use of environmental management control system is found to be positively correlated to environmental performance and environmental management practice. However, the finding does not support the postulate that environmental performance will be influenced by an extensive use of an environmental management control system. The findings suggest that even though there is a positive correlation between the extensive use of an environmental management control system and the environmental performance, the level of environmental performance does not necessarily depend on whether or not the hotels use an environmental management control system, extensively.

This finding contradicts with the findings of studies carried out by Henri and Journeault (2006) and Tekavcic et al. (2005), which report a positive and significant effect of the management control system on performance. However, Henri and Journeault (2006) examined environmental performance in a manufacturing setting, while Tekavcic et al. (2005) studied the effect of a management control system on the financial performance in general. These contradictory findings may be due to the sector industry as the current study examines the hotel sector. The findings may also

differ due to the way environmental performance is measured by researchers either in the hotel sector or in the concepts used.

Given the non-significance of an effect of the extensive use of the environmental management control system on environmental performance, a separate test was conducted for each of the environmental management control system elements. As far as the specific management control elements were concerned, a positive coefficient with environmental performance was expected for two elements (budgeting control system and cultural control system) and a negative coefficient for the other two elements (interactive control system and environmental information system). However, only a positive relationship between an environmental budgeting control system and environmental performance was found to be statistically significant.

#### **7.2.1.1.2 Interactive Control System**

An interactive control system was not found to be a significant indicator of the level of environmental performance. This finding contrasts with that of Baba's (2004) study and Henri and Journeault's (2006) study where they found a positive relationship. However, this current study found that implementing environmental management practice was a good indicator of the extensive use of an interactive control system. There was a positive and significant relationship between environmental management practice and the interactive control system.

This finding suggests that the extensive use of an interactive control system would not boost environmental performance unless top management and employees are involved

and adequately equipped with the relevant knowledge and skill. Even though hotels practise environmental management practice, without staffs knowledge and skill, the results suggest environmental performance will not improve. However, as Simons (1995) suggests, an interactive control system may motivate firms to search for new strategies and to adapt to the new strategies and practices to enhance performance. For example, even though the top management and employees are involved personally and interactively in environmental management practice and decision making, if they do not have a sound skill and knowledge base regarding the environmental matters in questions, their decision making ability may be limited. These results could indicate that a lack of environmental management expertise and resources lead to difficulty in achieving 'green' objectives. For example, as mentioned in ESCAP Tourism Review (no 22) (2001), the shortage of skilled personnel in environmental management practice poses a major threat to sustaining the development of the tourism industry.

On the other hand, the incentive and reward system could also be related to this finding. For example, even though in some cases top management and employees have sufficient knowledge and skill regarding environmental issues, without a proper incentive and reward system, they would not transfer this into action in day to day management of the hotel. They might make a decision that will benefit them through the reward system regardless as to whether the decision made will harm their firm.

This finding may also be related to several other factors. First, the setting of the organisation may influence the results. As mentioned in the literature, based on the contingency theory, the management control system should be designed in accordance

with the nature of the organisation (Simons, 1987, 1990). Since the current study used the hotel sector as a unit of analysis, the contradictory findings with Baba (2004) and Henri and Journeault (2006) was expected as both the above-mentioned studies examined manufacturing firms.

Second, the resistance of adapting to a new culture might cause knowledge and belief to be inadequately spread and shared. As mentioned in previous chapters, environmental problems are newly emerging issues in the Malaysian hotel sector. Thus, top management and employee involvement are possibly currently not sufficient for the people involved to gain better knowledge and skills to increase performance. Therefore, any changes or alterations in daily and routine tasks can result in resistance from employees. Possibly top management could actively involve all staff members to increase their acceptance of the changes in order to enhance performance. If the people in the hotels, such as employees and customers, refuse to change their attitudes, the probability of achieving better environmental performance is not high. For example, changes in 'the use' of resources in hotels, such as reusing towels or by reduction in air-conditioning used, can not be monitored properly and directly only through hotel environmental culture and staff's actions. This is because the hotel nature is subject to the client-based behaviour and this behaviour is expected to influence the tasks performed by hotel staff.

The third potential factor could be top management and employees are likely to be motivated by an incentives system which was designed in order to facilitate them to achieve the objectives. Thus, the incentive system may explain the effect of the interactive control system on environmental performance. As Epstein (1996) and

Merchant (1997) mentioned, the right incentives will get people to take responsibility for what they do and therefore, can motivate to achieve the desired objectives. Even though, some hotels have an environmental management practice, without a better rewards system, they do not fully motivate staff to achieve the objectives set by the hotels' management. In fact, the hotel managers interviewed for this study complained that they are likely not to know about any effort, programmes or incentives offered from the Malaysian government or any related-association. Thus, if staffs were to know the incentives available to them if they implement proper environmental management practice, environmental performance would possibly improve.

These results may also be related to the size of the hotel. The size of the hotel was measured by the number of rooms. However, the number of rooms does not necessarily indicate the standard of the hotels. So, if the hotel size is disregarded, the interactive control system does not appear to influence the level of environmental performance.

Therefore, the study concludes that even though the interactive control system is influenced by environmental management practice, the interactive control system is not an indicator of the level of environmental performance for the following reasons:

- The lack of an active involvement of top management and employee and an adequate level of skills and knowledge.
- An inadequate incentive system
- The customer-based behaviour

Therefore, this study suggests that the following factors might influence the level of environmental performance.

- Hotel staff should be equipped with the adequate skill and knowledge by conducting regular awareness and environmental training.
- Implement a sensible bonus and reward scheme for staff which rewards them for improving environmental performance.
- Educate customers to accept a new emerging culture in the hotel environment by using pamphlets or stickers to deliver the message regarding environmental issues.

#### **7.2.1.1.3 Environmental Budgeting System**

The environmental budgeting system was found to be significantly and positively related to environmental performance and environmental management practice. This result is similar to the findings of Henri and Journeault (2006) but contradicts those of Bisbe and Otley (2004) on the relationship between budgeting systems and performance. In addition, Ferguson and Berger (1986) found that budgeting control system would be contingent upon the firms' practice.

The hospitality literature stresses the importance of budgeting systems in order to plan and control the cost of the hotel sector (Ferguson and Berger, 1986; Sharma, 2002). By integrating environmental matters into the budget, such as putting all the costs related to environment activities as an environmental expense and not as an overhead cost, hotels are more likely to improve their environmental performance. This result is expected because the control system in the hotel sector mainly depends on the

budget (Fitzgerald et al., 1991; Brown, 1996; Sharma, 1996). The more extensively environmental budgeting is used in the hotel sector, the greater the effect of an environmental performance might be. By using a budget system, hotels will have a proper plan to control their costs and revenues such as the cost of training staff and the cost of hiring a new environmental manager. Practices such as environmental quality programmes, environmental training and pollution prevention activities are likely to lead to the extensive use of budgeting systems in the environmental context.

This finding suggests that the extensive use of environmental budgeting is likely to be an indicator to boost environmental performance. If the hotels integrate environmental costs, expenses and revenues into the budgeting system, the system can be used to control and manage environmental problems thus leading to better environmental performance. This is due to all environmental activities being carried out in accordance with the budget and therefore, expenses are less likely to exceed what has been planned. Thus, goal congruence is promoted and people are motivated to make an additional effort in order to ensure the cost of pollution problems is reduced and environmental reputation is improved.

Considering that environmental issues are a new public concern in Malaysia, the factor of hotel structure could be expected to be an explanatory factor for the above findings. The analysis of standard multiple regressions found that there was a positive and significant relationship between hotel structure and an environmental budgeting system. The result is similar to Sharma (2002). Sharma (2002) found that hotel structure is associated with some budget system characteristics of a hotel.

However, the results suggest hotel size does not significantly influence the environmental budget system in the hotel sector. This result may be explained by the fact that some large hotels may offer limited services and facilities despite the number of rooms. This is a possibility because hotel sector has a complexity of operation as some large hotel offer services based on packages and not on an individual basis. For example, if guests stay in luxury rooms, they will be offered a discount for being a member of the hotel and access to other facilities such as the swimming pool or gymnasium is free. This result contradicts the finding of Sharma (2002) who found that hotel size is associated with the budgeting system, however, his study was not based on an environmental perspective.

Therefore, from the above explanation, hotel size and hotel structure can act as a booster to improve environmental performance when the hotel considers the cost, expense and revenue gained from the environmental activities, such as hiring a new environmental manager, the cost of conducting environmental training and revenue from package offers, are included in the budget system. Thus, the environmental budgeting system and environmental performance contingency relationship observed in manufacturing firms (Henri and Journeault, 2006) could possibly be generalised to the hotels in the sample of this study.

#### **7.2.1.1.4 Environmental Information System**

The environmental information system was found not to be significantly related to environmental performance. The coefficient is negative and contrary to earlier expectations. This result clearly explains that the environmental information system



will have a negative effect and not be significant in relation to environmental performance. This result contradicts those findings of Baba (2004) and Henri and Journeault (2006).

However, the environmental information system has a significant relationship with environmental management practice. The results suggest that the more hotels practise environmental management activities, the more use and benefit the environmental information system has. It is because, according to Schaltegger et al. (2003), the environmental information system is important in communicating practice and strategy to stakeholders. However, a greater use of environmental information systems does not mean environmental performance will improve.

This result suggests that the environmental information system does not help to reduce environmental deterioration if hotels do not use the information appropriately. For example, if the hotels extensively use environmental information systems to collect environmental data and have a massive amount of information, but the hotels do not use the information properly to monitor the environmental problems through their practice, environmental performance will not improve. However, if the hotel has less information but extensively uses their information system, the proper management of the information can contribute to environmental cost reduction and thus reduce environmental impact.

Therefore, the result from the analysis raises very interesting ideas to be further elaborated on as to why firms cannot reduce their environmental impact through their

practice when they have a proper environmental information system and why the system cannot predict environmental performance.

First, in Malaysia, the hotels' environmental audit (as one indicator to gather environmental information) was used merely to check their continuous compliance with the relevant legislation such as the Environmental Quality Act 1974. Biondi et al. (2000) mentioned that an environmental audit is a tool with which small and medium firms are involved but not as extensively as expected. For example, hotels carried out an environmental audit either because it is required by the statutory authority or as an essential part of the environmental management programme of the hotels. Based on the interview finding, all respondents interviewed agreed that the hotels practised an environmental audit especially in terms of waste audit but did not apply the information to other environmental problems. In other words, most of the sampled hotels in Malaysia practised environmental management only as an 'end-of-pipe' approach. Therefore, the possibility of their environmental performance achieving a better level is not guaranteed.

Secondly, the extensive use of an environmental information system can lead to proper reporting of environmental information. As Jaafar (2001) suggested, environmental information must be disclosed if the information is relevant to the decision making process. However, in Malaysia, due to the lack of regulation of the environmental issues in the hotel sector, the hotels are more likely not to consider the importance of transparency of their practices to the public and stakeholders. The interview analysis found that the reputation for environmental performance was measured by looking at the increase in hotels' guests. Interviewees said that

stakeholders are more likely to be interested in financial profit reports, than subjective reports.

To summarise, the finding of this study suggests that an environmental information system does not act as an indicator to improve environmental performance unless the hotels use the information provided by the system extensively to support decision making and thus, contribute to the reduction of environmental impact and improve their environmental performance. No matter how much the content of the information, the proper use of the information should be a priority in the decision making process.

#### **7.2.1.1.5 Cultural Control System**

The cultural control system was found to not be significantly related and contribute to the level of environmental performance. This result suggests that culture does not act as an indicator to ensure hotels will achieve better environmental performance. Hunt and Auster (1990) suggest that firms should implement cultural control systems related to environmental issues to increase people's willingness to initiate environmental improvement, but the result shows that even though hotels create an environmental culture in their activities, if people are not ready to share their knowledge to create values and to change their beliefs, better environmental performance will not be achieved.

Descriptive statistics in Table 6.4 show that the mean of environmental culture is a negative sign. This result implies that most of the sampled hotels in Malaysia employ a control dominant type of culture which refers to formality, rigidity and more

strictness and tightness in achieving objectives. All the activities carried out are rigid and not flexible. Thus, adaptability to a new strategy is more difficult. This finding is similar to the traditional control system where formal and control feedback were considered vital to achieve better performance (Anthony, 1965), however, as Simons (1987) suggests the new emerging issues such as environmental issues should be opened for new ideas in order for firm to change and be responsive to enhance environmental performance.

On the other hand, this insignificant finding may be due to the environmental issues being a new concern in the Malaysian environment and not currently properly managed by the hotel sector (Kasim and Scarlat, 2007). One reason may be related to interactive action from the top management and employees. If people in the hotels are not well trained, the knowledge and skill do not spread and are not shared properly. Thus, new values and beliefs cannot be created and thus, the attitude of people towards environmental issues would not change. Interview findings also suggest that environmental culture builds from day-to-day experience.

In conclusion, the result suggests that in order to achieve better environmental performance, the management and employees should be ready and flexible to accept new ideas and share a belief system which leaves them open towards new ideas (environmental matters). Even though the hotels can create and use a new culture extensively, without willingness to adapt to a new environment, the hotels will not meet their objective of reducing environmental impact. This idea supports the notion of the contingency theory that culture of the firm is contingent upon the nature or strategy of the firm.

#### 7.2.1.1.6 Environmental Management Practice

The correlation analysis found that environmental management practice is significantly correlated to environmental performance. This result suggests that using environmental management practice is likely help to reduce environmental deterioration and could improve environmental performance. However, the regression analysis shows that the occurrence of environmental management practices is not directly a significant influence on environmental performance.

Hotel size has a significant effect on environmental management practice and this result contrasts with Baba (2004) where she found that size was not significantly related to environmental management practice. As Delmas (2002) proposed, the larger hotels are known to enjoy economies of scale in the adoption of superior environmental management practices because they have more resources and capital. Sharma and Vredenburg (1998) also mentioned that large firms have a greater possibility of investing in environmental protection. Merritt (1998) and Andersen (1997) also support the result in that they suggest that large firms usually apply more formal environmental management systems including reuse, recycling and valuation of waste in their activities.

In fact, as expressed by the hotel managers interviewed for this study, hotels in Malaysia practise the activities which are related to pollution prevention but sometimes large hotels which have more resources do not show interest in participating in these activities which relate to voluntary environmental programmes, unless they are organised by the government. Environmental management practice

may also be reinforced by legislation or environmental taxation of the hotels. It means that although legislation exists, it is not strictly enforced and the situation of encouragement rather than coercion exists. Therefore, environmental management practice is not considered to influence hotels' environmental performance if all those above mentioned reasons happen.

Besides that, with chain components, standardised programmes such as training and awareness programmes can easily be implemented and therefore, lead to successful implementation of environmental management practice. The result is also similar to the studies carried out by Darr et al. (1995), Ingram and Baum (1997), Brown and Dew (1999) and Gil et al. (2001), where it was found that transferable and changeable skills and knowledge between chains will lead to an increase in the efficient use of resources and to extensive adoption of environmental management practices among the chain.

The hotel managers interviewed for this study also discussed the situation where the hotels which have chain affiliation achieve ISO 14001 and hire hygiene managers to handle the environmental problems. Both the situations of achieving ISO and the employment of hygiene managers reflect the commitment of the hotels towards implementing environmental management practices according to their home base office or their chain affiliation. Most chain affiliation is internationally based. Carmona-Moreno et al. (2004) mentioned that chain affiliation will standardise the form of activities carried out by hotel management. On the other hand, skill and knowledge are easily transferable between chains. Therefore, international-based

chain affiliation may be a good explanation for the above result and may be a good area for future research.

The descriptive result shows the encouraging practise of environmental management activities. This finding is similar to the study carried out by most of the cited authors in the environmental management literature, such as Carmona-Moreno et al. (2004), Aboulnaga (1998) and Lawrence et al. (1998). They found that environmental management practice assists firms to evaluate their environmental performance and highlighted that low committed firms will have no advantage towards achieving the better environmental performance.

Even though there is a significant correlation between environmental management practice and environmental performance, the relationship is not strong (Cohen, 1988). Two plausible explanations can be offered to explain these results. First, in Malaysia, hotel facilities may not be perceived as a 'polluting' industry like manufacturing firms. The hotels are more likely to implement minimum environmental management practices to protect their environment such as encouraging guests to reuse their towels or introducing non-smoking areas. The hotels also appear to demonstrate no or little interest towards voluntary programmes that assist hotels to achieve better environmental performance. Some hotels are expecting to improve their environmental performance without actually practising the correct environmental management activities.

Secondly, even though some large hotels in Malaysia are part of international chains who contribute to the effectiveness of environmental management practice, hotels in

Malaysia have a lack of facilities with respect to implementing environmental management practice which goes beyond mere compliance of environmental performance. As expressed by the hotel managers interviewed to clarify this issue, the lack of technical assistance could be one of the reasons why hotels refuse to go beyond-compliance.

In summary, the results of this study suggest that the practice of environmental management may not necessarily improve environmental performance. The hotels in the sample are more likely to be engaged in end-of-pipe activities where their activities show a reactive strategy and not a proactive strategy. Considering the environmental issue in Malaysia is still at in its infancy (Jaafar, 2001; Baba, 2004), this study suggests that environmental management practice should be considered by looking at the effects of other practice as well, such as management control systems, in order to substantially improve environmental performance. As mentioned by Simons (1995), in order for practice to enhance performance, the design of management control systems should be tailored explicitly to practice.

#### **7.2.1.2 The Mediating and Moderating Effect**

The mediating effect and moderating effect are tested by using hierarchical multiple regressions. The mediating effect is when the relationship between environmental management practice and environmental performance is influenced through the use of the environmental management control system, while the moderating effect is when the environmental management control system will reduce or enhance the direction of the relationship between environmental management practice and environmental performance.



### 7.2.1.2.1 The Mediating Effect<sup>84</sup>

The first requirement to test the mediation effect was met where environmental management practice is significantly related to environmental management control systems and also with each of the environmental management control elements. This relationship also coincides with the correlation analysis where the correlation coefficient suggests significant correlation between environmental management practice and the environmental management control system and its elements individually.

The standardised coefficient also provides support for the existence of a direct link between environmental management practice and environmental performance, which is shown in Table 6.21, Model 1. Thus, the second requirement for the mediation effect is supported.

Table 6.21 however shows that even though the correlation between the environmental management control system and performance is significant, as far as each element of the environmental management control system was concerned, only the interactive control system and environmental budgeting were significant mediators to environmental performance. Therefore, the result indicates that path analysis using multiple regressions does support the postulate that there is an indirect effect (mediating effect) on environmental performance acting through the interactive control system and the environmental budgeting system. The indirect effect (mediating effect) of environmental management practice on environmental

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<sup>84</sup> The indirect effect (mediating effect) of environmental management practice on environmental performance through the extensive use of the management control system. The indirect and mediating effect will be used interchangeably through out the thesis

performance, acting through the environmental management control system has been summarised in Table 6.22.

The results in Table 6.22 indicate that there were very strong indirect effects of environmental management practice on environmental performance acting through the interactive control system and the budgeting control system. The threshold of 0.06 and above in the path coefficient of indirect effect was suggested by Bartol (1983) and Mia and Clarke (1999) as an indicator to see whether the indirect effect was a strong or a weak effect. Thus, the result from Table 6.22 shows the indirect effect path coefficient is more than 0.06 for both mediators. In addition, the environmental management control system as a package also shows the strong indirect effect of environmental management practice on environmental performance through its action. However, the environmental management control system gives a negative mediating effect to such a relationship.

This result suggests that the relationship between environmental management practices and environmental performance can be influenced by extensive use of the interactive control system. The effect of the use of the interactive control system on environmental performance can be explained by the increase in R square (Table 6.21) for about 17.2 percent and the strong indirect effect is more likely to result from the strong relationship between an interactive control system and environmental performance. This result is similar to that of Govindarajan and Gupta (1985) and Hunt and Auster (1990) where they found that an increase in performance could result from a better bonus system (one of the indicators of the interactive control system).

The result also suggests that the environmental budgeting system increases the explanatory power of the link between environmental management practice and environmental performance for about 16.7 percent (see Table 6.21). The strong indirect effect is also explained by the strong relationship between environmental budgeting and environmental performance. This study supports the argument given by Abernethy and Brownell (1999) where they stated that by using budgeting extensively, performance will be increased. However, this study contradicts that of Bisbe and Otley (2004) where their study found that budgeting was not a mediator in the relationship between innovation and performance. The contradictory findings between this study and Bisbe and Otley's (2004) study are more likely to be due to a different perspective and a different sector. They use innovation strategy in manufacturing firms, while this current study uses environmental perspective in the hotel sector.

However, the results of the tests of the mediation model regarding the effect of the environmental management practice, through environmental information system and environmental culture, on environmental performance are not supported. In fact, correlation analysis does also not support the assumptions that the environmental information system has a significant relationship with environmental performance and also environmental culture has a slightly weaker correlation with environmental performance..

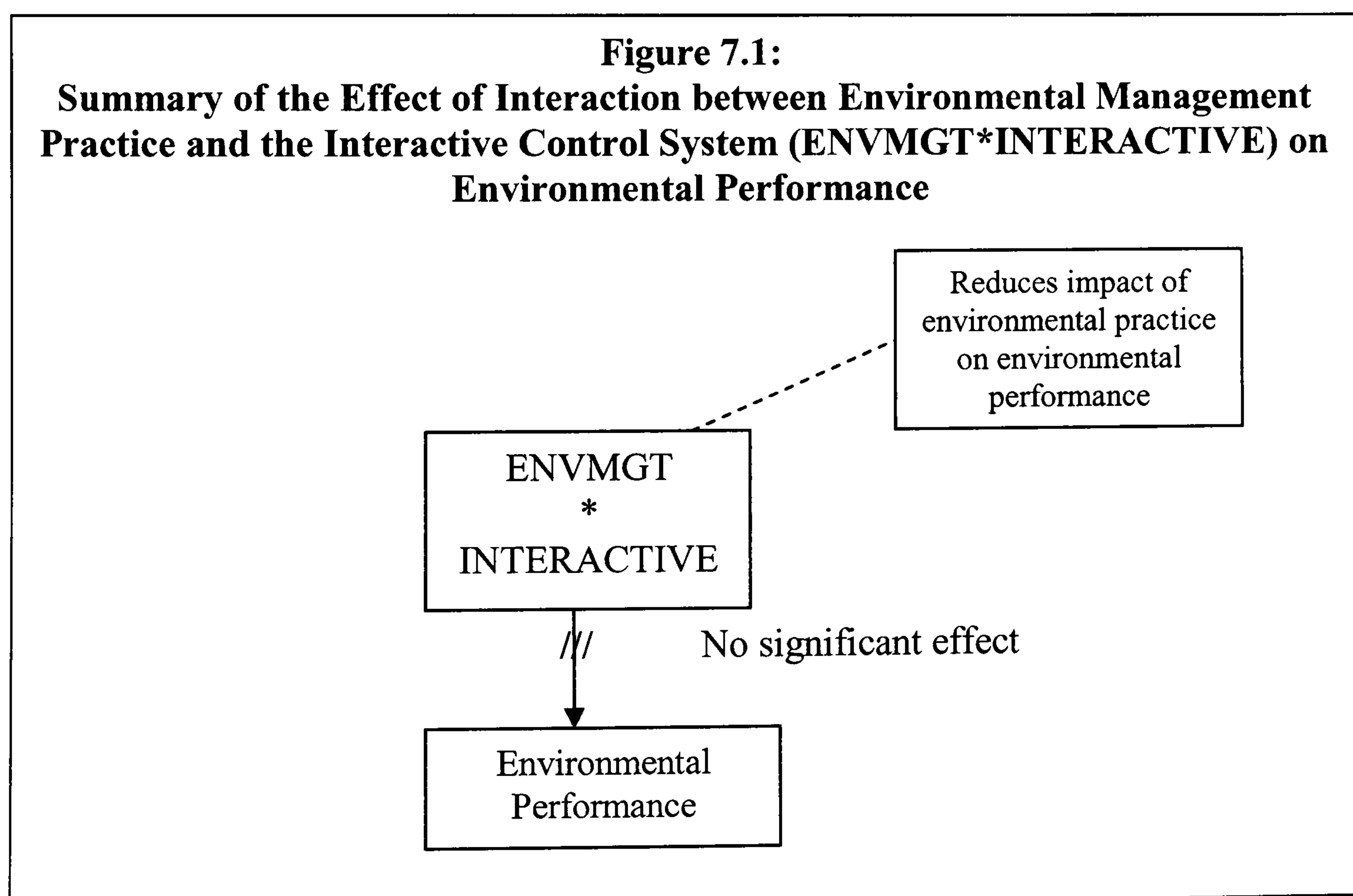
One plausible explanation regarding the insignificant indirect effect on environmental performance through the use of the environmental information system and

environmental culture is likely to be due to the lack of awareness and understanding among the hotel sector regarding environmental issues. As mentioned in the previous chapter, environmental issues are new management issues in the hospitality sector since this sector was known as a 'hidden' sector in terms of environmental matters (Blair and Hitchcock, 2001). In comparison to the manufacturing sector, the hotel sector appears to depend far less on physical resources for their basic operation. However, according to Blair and Hitchcock (2001), even though the environmental impact on the hotel sector is less obvious or hidden, it does not mean that there is no environmental impact. Malaysia is one of the countries where environmental issues are still at the infancy stage (Jaafar, 2001; Baba, 2004). Therefore, a lack of knowledge, skill and legislation leads to a lack of awareness among the industries, especially the industries such as the hotel sector. The hotel sector in the sample does not appear to be concerned regarding environmental problems, for example, the water pollution problem, thus hotels do not seem to use information systems appropriately and seem to refuse to change their belief system in the industry.

Hence, this study can conclude that by using the appropriate interactive control system and budgeting system, environmental performance can be increased and this improves the relationship between environmental management practice and environmental performance. Since the budgeting system is known as an important control system in the hotel sector (Brown, 1996), the result is expected. The expected result is also similar with that concerning the interactive control system, which is known to be an important control system in order to emerge new ideas and share knowledge regarding new issues such as environmental issues (Simons, 1995).

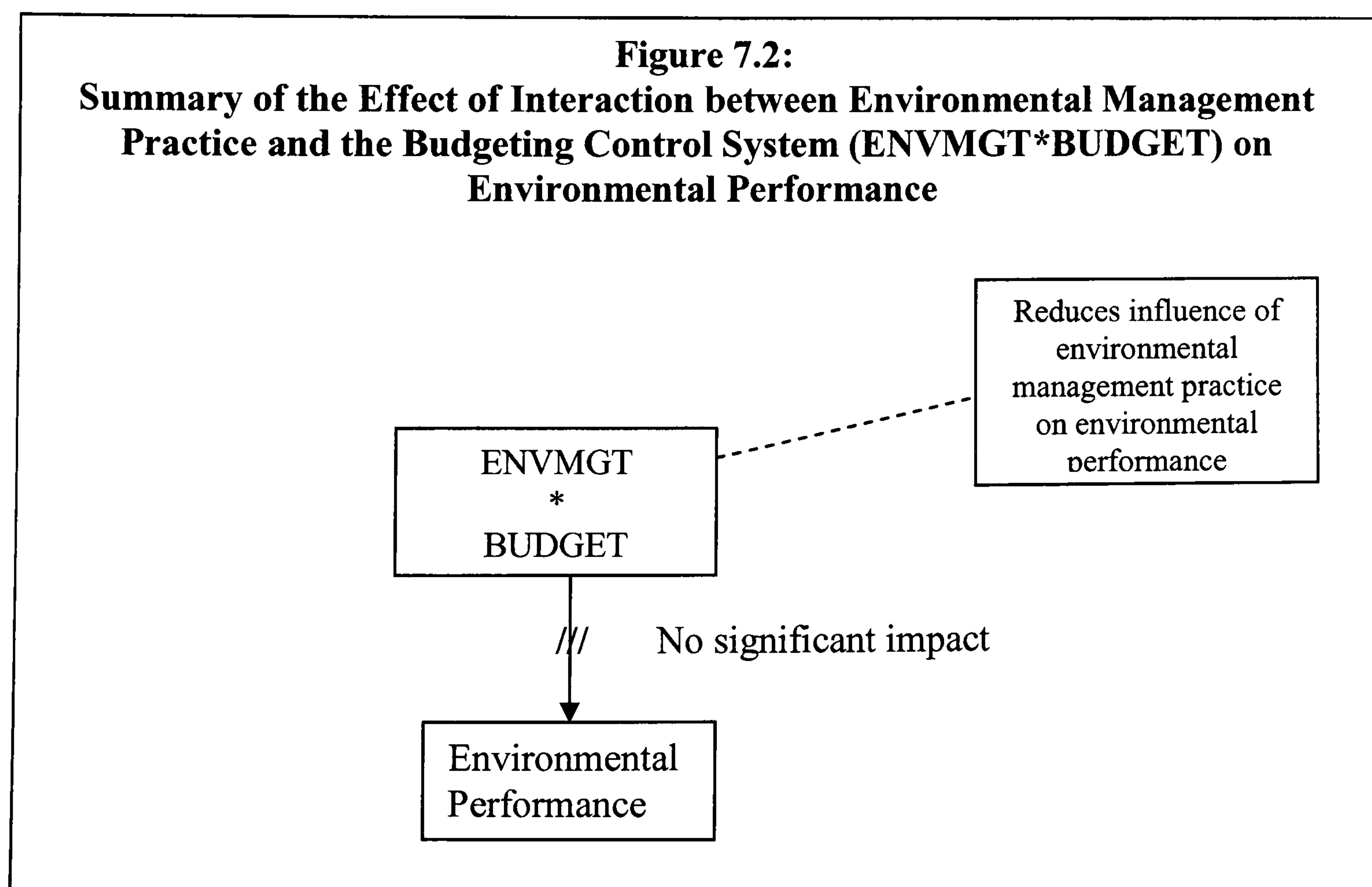
### 7.2.1.2.2 The Moderating Effects<sup>85</sup>

The result from Table 6.23 shows a significant increase in the explanatory power when the moderating term is introduced. The result does not support the postulate that environmental management control system moderates the relationship between environmental management practice and environmental performance. Having this insignificant result, this analysis is replicated for each individual element of the environmental management control system such as the environmental information system, the cultural control system, the interactive control system and the environmental budgeting system.



<sup>85</sup> The moderating effect of the extensive use of the management control system on the relationship between environmental management practice and environmental performance.

Figure 7.1 summarises the effect of interaction between environmental management practice and the interactive control system (ENVMGT\*INTERACTIVE) on environmental performance. The analysis shows that the interaction between environmental management practice and the interactive control system (ENVMGT\*INTERACTIVE) has no significant effect on environmental performance. However, the interaction reduces the effect of environmental management practice on environmental performance. This result suggests that even with or without interaction between environmental management practice and the interactive control system, environmental performance would not change much. The hotels that are committed to environmental management practice and apply interactive control systems have similar interests to hotels that have no commitment and do not use interactive control systems in practising environmental management.



Similarly, Figure 7.2 shows the interaction between environmental management practice and the budgeting control system (ENVMGT\*BUDGET) has no significant effect on environmental performance. However, the interaction slightly reduces the effect of environmental management practice on environmental performance. This result suggests that the interaction of environmental aspects and the budgeting system does not much change environmental performance in the hotel sector. Moreover, the direct effect of environmental management practice on environmental performance is significant compared to when the practice has interaction with budgeting system (reduced from significant to non-significant). This finding suggests that hotels are more likely to enhance their environmental performance through the use of the budgeting system (mediating effect) and not by using the interaction of the budgeting system with environmental management practice. This moderating finding contrasts with Bisbe and Otley (2004).

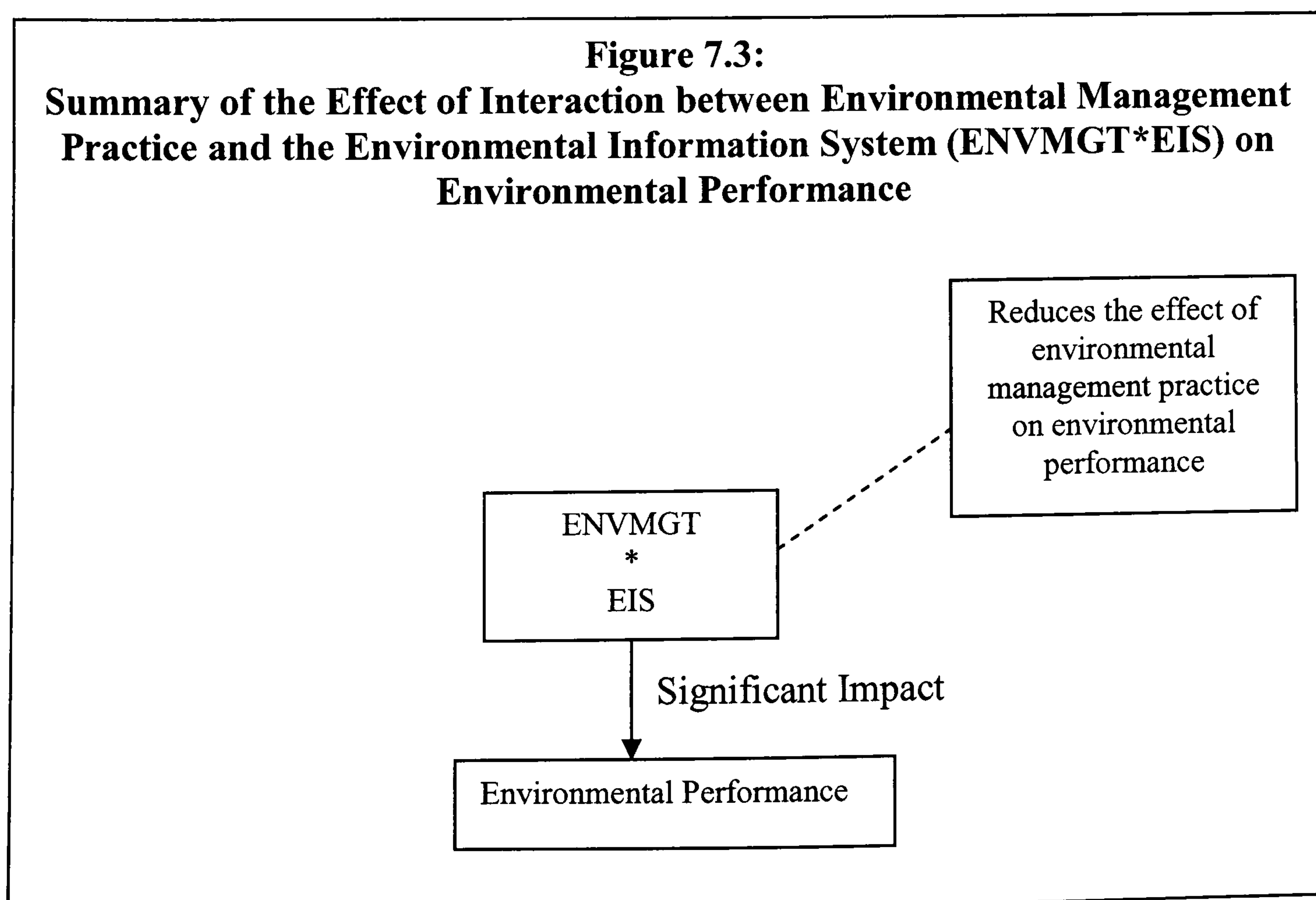
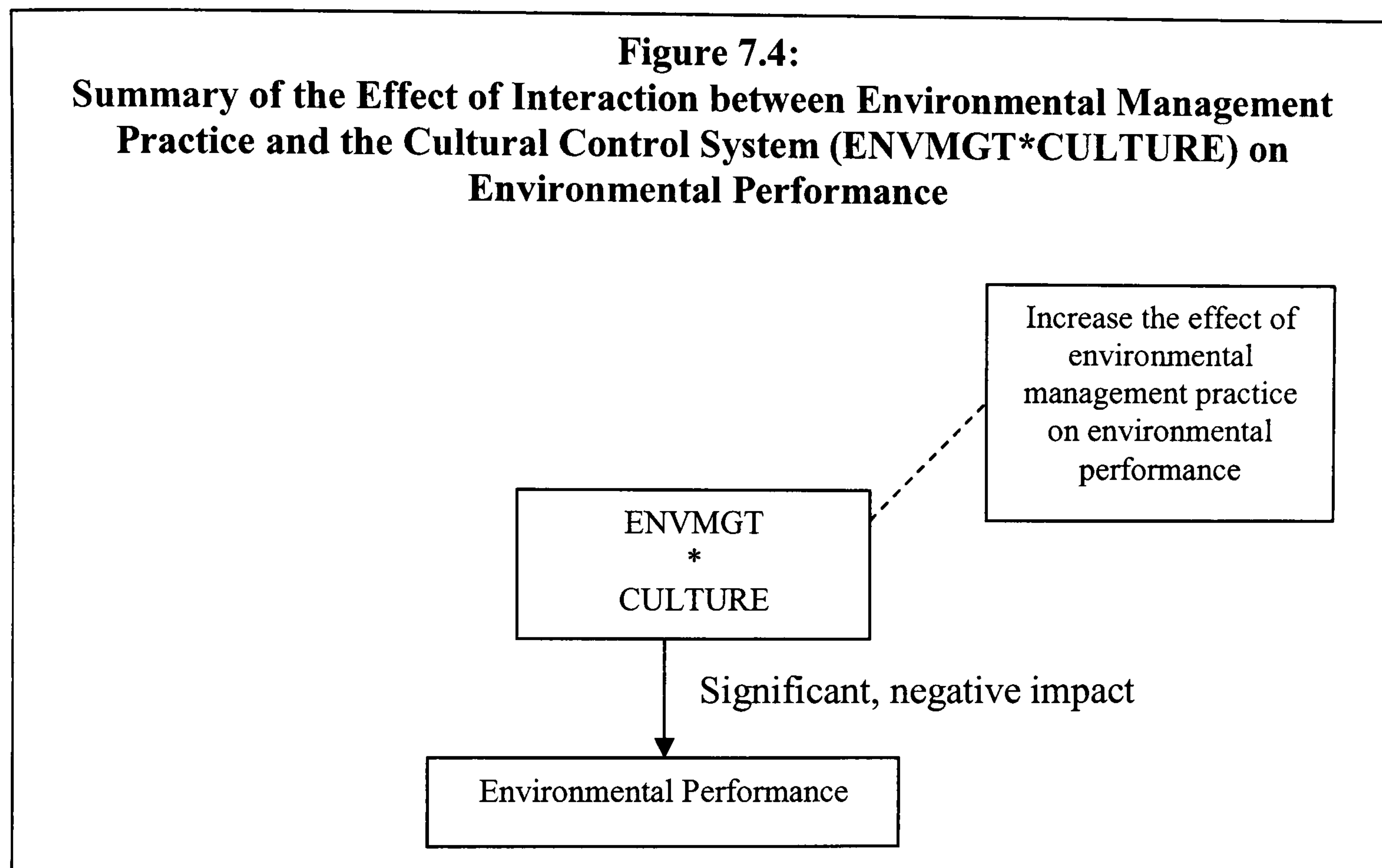


Figure 7.3 summarizes the result which shows that interaction between environmental management practices and environmental information system (ENVMGT\*EIS) has positively significant effect to environmental performance. However, this interaction changes the effect of environmental management practice on environmental performance where it becomes non-significant. This change indicates that the interaction between environmental management practice and environmental information systems reduces the effect of environmental management practice on environmental performance. The negative coefficient suggests that the more the hotels integrate and use environmental information systems to inform environmental management practice, the less its effect on environmental performance, while the less the hotels consider the environmental information system in their environmental management practices, the more greater its effect on environmental performance. The interaction also changes the significance level of environmental information systems on environmental performance from negatively not significance to negatively significance. Without interaction, the environmental information system has no significant effect on environmental performance.

Furthermore, the result also shows that interaction between environmental management practices and environmental culture (ENVMGT\*CULTURE) has a negative significant effect on environmental performance. This interaction also influences the effect of environmental management practice on environmental performance by increasing the explanatory power of the model. The coefficient is opposite from expected. A negative coefficient of interaction effect of environmental management practice and environmental culture suggests that the more hotels



integrate and use environmental culture in environmental management practice, the less the effect on environmental performance, while the less the hotels consider the environmental culture in their environmental management practices, the greater the effect on environmental performance. Figure 7.4 below summarises the result of interaction effect of ENVMGMT\*CULTURE on environmental performance.



Without an interaction effect, environmental culture has no significant effect on environmental performance. Environmental performance, statistically, is similar between hotels that are committed to environmental management practice by employing flexible type of culture and those who are not committed to environmental management practice by employing control-type of culture (refer to Figure 6.5). By entering the interaction between environmental culture and environmental management practice, hotels who commit differently appear to have different levels of environmental performance.

### **7.2.2 Environmental Management Practice in the Malaysian Hotel Sector**

The result shows that more than 55 percent of the sampled hotels in Malaysia engage in environmental management practice. Pollution prevention activities such as training, research and development, incentive programmes and hiring managers to manage pollution prevention activities are the activities that occur most in the hotel sector in Malaysia.

In fact, the hotel managers interviewed for this study also confirm that they are involved most in pollution prevention activities. According to interview findings, pollution prevention techniques include techniques of how to reduce environmental pollution such as conducting recycling programs, protecting biodiversity, educating guests, public and staff about how to prevent the environment from being polluted, reducing energy consumption and monitoring waste production. Rather surprisingly, the managers interviewed mentioned that most of the hotels in the sample adopt environmental management practices only with regards to the activities which are related to factors such as reusing towels and introducing a non-smoking area. It appeared that the activities which related to the environment were carried out only if they actually cut cost and simultaneously returned the benefits to the company.

This condition brings us to the conclusion that the environmental performance in hotel sector in Malaysia could be not improved further. The plausible explanation that can explain this condition is possibly because Malaysia is at an intermediary stage of development (Baba, 2004) and is still facing a tremendous challenge in meeting tourism sustainable development. Therefore, any activities organised by the hotels

appear to be only concerned with the bottom line, such as using low energy light bulbs, recycling and educating guests to reuse towel and that these efforts are not genuinely concerned about the impact of their operations on the environment. In fact, some of the respondents expressed concern over certain eco-friendly measures, such as asking guests to re-use towels, as this may affect the enjoyment of a guest's stay and cause the hotel to lose its customers. Therefore, this condition may illustrate the conflict of interest among the hotels in the study regarding 'luxury' practice.

This finding is not surprising because it is similar to the findings in Iwanowski and Rushmore (1994), Stabler and Goodall (1997) and Knowles et al. (1999). They found that some hotels in their study have reservations about implementing water and energy conservation practices because it is believed that such practices are in conflict with the principle of luxury accommodation.

Findings from the present study agreed with the research conducted by Stabler and Goodall (1997) and Knowles et al. (1999) that promotion of environmental management practices among hotels in the study has not been very effective. Hotels in Malaysia mostly depend on government agencies such as the local authority and the Department of Environment as a source of information regarding the environment. This can be shown by looking at the insignificant effect of the environmental information system and environmental culture on environmental performance

### 7.3 Chapter Summary

This chapter presents the discussion and summary of the findings and compare the findings of the study to the relevant literatures cited in the study. This study can be concluded as follows:

- The environmental management control system can influence the relationship between environmental management practice and environmental performance. However, the findings of this study show that not all control system are applicable to all industries. Contingency theory suggested that the elements of the management control system used in any firms are contingent on the nature or setting of the firm.
- The interactive control system and budgeting control system are found to have a mediating effect on the relationship between environmental management practice and environmental performance. Whereas, the environmental information system and cultural control system have a moderator effect on such a relationship.
- Hotel structure is one of the indicators which has a significant influence on environmental management practice and environmental management control system, thus, improving environmental performance. The type of structure employed in the hotel sectors appears to influence the practice implemented in the hotels.
- Even though, environmental management practice appears to have a relatively high correlation with environmental performance, the occurrence of environmental management practices does not seem to directly significantly influence environmental performance.

- In summary, as Malaysia is still in its infancy regarding environmental management practice, the challenges for firms to implement such practices to enhance environmental performance are becoming of more interest among firms, in general, and hotels in particular. This is shown by the quotation from respondents interviewed which mentioned that hotels are now trying to implement the activities such as reusing towels, introducing non-smoking areas and put the pamphlets on environmental concern in guest rooms.

The results of this study have provided insight into some explanatory factors that have significant effects on environmental performance and at the same time, provided some explanation regarding the role played by the environmental management control system on the relationship between environmental management practices and environmental performance.

A summary of the entire study, including assumptions and limitations, implication and suggestions for future research are presented in the final chapter.

## **Conclusion and Recommendations**

### **8.1 Introduction**

This chapter summarises the study and discusses the implications, contributions, assumptions and limitations of the study, provides suggestions for future research and the conclusion. The first section is devoted to the summary of the study and the second section focuses on the implications. Then the third section provides the contribution followed by the assumptions and limitations of the study. Finally, the next section is devoted to suggestions for future research and the conclusion of the discussion is presented in the final section.

### **8.2 Summary of the Study**

As mentioned in Chapter 1, this study gained its impetus from the argument that previous studies on management control systems, such as Simons (1987, 1990, 1991), Anthony and Govindarajan (2001) and Henri and Journeault (2006) do not differentiate the effect of management control system on the relationship between practice and environmental performance. In addition, the contradictory findings from previous literature such as Carmona-Moreno et al. (2004), Cordeiro and Sarkis (1997) and Klassen and McLaughlin (1996) on the relationship between environmental management practice and environmental performance were also a motivation for this study to be conducted. On the other hand, this study was also motivated by the concern of the 'hidden' environmental problems in the service firms where most of the previous studies such as Baba (2004) and Henri and Journeault (2006) focused on manufacturing firm, thus ignoring the significant impact of environmental problems in the service firm.

Therefore, this study is an exploratory study and an empirical attempt at finding plausible answers to several questions pertaining to the role of the management control system in the relationship between environmental management practice and environmental performance. The following questions are addressed as follows:

- 1) What role the management control system plays in such a relationship?
- 2) Are the contradictory findings of the relationship between environmental management practice and environmental performance due to a lack of a management control system?
- 3) What is the relationship between environmental management practice and environmental performance in the hotel sector?
- 4) What is the current environmental management practice in the Malaysian hotel sector?

This study employs a sequential explanatory mixed method in order to collect the data by using a questionnaire survey and an interview survey in the Malaysian hotel sector. Descriptive statistics are reported and Correlation Analysis and Multiple Regression Analysis are performed to gain answers to the above questions.

Accordingly, the findings of this study unveiled that:

- 1) The relationship between environmental management practice and environmental performance can be enhanced through the use of an interactive control system. However, the extensive use of an interactive control system does not appear to boost hotel environmental performance if the top

management and employees lack relevant knowledge and an appropriate skills and the incentives and the rewards system does not appear to be in place. This may be due to resistance in adopting a new culture which may hamper the communication and sharing of knowledge and beliefs. The interaction effect between environmental management practice and interactive control system does also not appear to influence environmental performance.

- 2) The existence of an environmental budgeting system appears to increase the explanatory power of the link between environmental management practice and environmental performance. However, the interaction effect between environmental management practice and environmental budgeting system does not appear to enhance or reduce environmental performance.
- 3) An environmental information system has a significant relationship with environmental management practice but does not appear to be related to environmental performance. However, the interaction effect between environmental management practice and environmental information systems appears to reduce the effect of environmental management practice on environmental performance.
- 4) An environmental cultural control system is not significantly related to environmental performance. An environmental cultural control system, however, moderates but does not mediate the relationship between environmental management practice and environmental performance.



- 5) In Malaysia, hotels appear to currently have activities that should support the achievement of environmental strategies such as introducing of non-smoking areas and reusing towels for guests who stay in their hotels. However, possibly because environmental management practice is an emerging issue in Malaysia, in general, a proactive approach does not appear to have been adopted. Although the respondents reported that they had identified waste as one of the environmental issues, the practices that would reduce waste problems such as reduce, reuse and recycle appear to be rather low.

In conclusion, even though this study suggests that there is no direct relationship between environmental management practice and environmental performance, the existence of a management control system can improve the relationship. This study suggests that environmental information systems and environmental cultural control systems moderate the relationship between environmental management practice and environmental performance. In addition, environmental management practices also can change their effect on environmental performance through the use of an environmental budgeting system and an interactive control system.

The elements of the management control system used in firms are contingent on the nature of the firms. Not all control system are applicable to all industries. Different industries and firms will have different control systems and different control system will have different roles in the firms. Therefore, this study supports the notion of the contingency theory in order to explain the relationship between environmental management practice, management control systems and environmental performance.

### 8.3 Implications and Contributions of the Study

This study suggests two major implications. First, the findings of this study have implications on the hotel sector and other related parties. It was found that many of the hotels in Malaysia do not see the full benefit of adopting as many environmental management activities as they can and have limited their activities to energy and water management. The finding suggests that as environmental management is a new emergent issue in Malaysian industry, in general, and the hotel sector in particular, the hotel sector should adopt as many environmental management activities as possible and at the same time, implement all the environmental management tools such as environmental management control systems in order to enhance environmental performance. This implication supports the suggestion given by Schaltegger et al. (2003) that management control systems which are related to the environment assists the firms in achieving the best environmental performance.

In order to enhance environmental performance, the following are recommended:

- 1) The hotel sector should be motivated to carry out as many voluntary actions as they can (such as recycling activities and pollution prevention programmes).
- 2) They should go beyond-compliance if they are aware of the opportunities present in tailoring management control systems with their own environmental management strategy and operations instead of being possibly forced to accept due to government legislation.
- 3) The hotels in the sample should use all the resources they have and grasp the opportunity given by chain affiliation (if it is available).

- 4) The hotels management itself should reward their employees who participate and give ideas towards achievement as a 'green' hotel.
- 5) Hotels need to involve more cost to install new technology and giving environmental and awareness training to their staff and the public as well.
- 6) The Malaysian government should introduce tighter regulation on existing and new hotel development with the aim of protecting the natural environment.
- 7) As many of the hotels believe that legislation is the main motive for improving environmental performance. Therefore, incentives such as grants and loan schemes should be introduced by the government to hotel sectors that show the commitment to operate their business in an environmentally-friendly manner.
- 8) Finally, the findings of the study also can potentially helping hotels to focus on what should be measured and managed environmentally to lead to environmental improvement.

Second, the findings of the present study make contributions to the area of environmental management and management control literature. The contribution can be divided into four categories; theoretical, managerial, research and regulatory contributions.

### 8.3.1 Theoretical Contribution

As mentioned in an earlier chapter, this study is exploratory because this study is the first attempt undertaken to bring two broad areas, environmental management and management control systems together in one study. This study examines the influence of management control systems on the relationship between environmental management practice and environmental performance. The findings of the present study thus contribute to filling the gap in empirical knowledge on environmental management and management control areas.

The present study also establishes a framework that shows the link between environmental management practice, management control systems and environmental performance. Even though, previous literature such as Simons (1995), Bisbe and Otley (2004) and Henri and Journeault (2006) look at the relationship between practice (strategy), control systems and performance, none of them discriminate between the roles played by the management control system within the relationship. The results of this current study show that elements of the management control system, such as the interactive control system and environmental budgeting play a mediating role in the relationship between environmental management practice and environmental performance in the hotel sector, while the environmental information system and environmental culture moderate the relationship. Thus, the present study contributes to the enhancement of understanding of contingent factor relating to the practice-control system relationship.

Furthermore, to date, the study is the first attempt to examine the relationship between environmental management practice, management control systems and environmental performance in the hotel sector. Most of the previous studies (Simons, 1987; 1990; 1991; Bisbe and Otley, 2004; Henri and Journeault, 2006) concentrate on manufacturing firms. Therefore, this study does not only contribute to environmental management and management control literature, but also to hospitality literature as well.

### **8.3.2 Managerial Contribution**

The results of the study help practitioners understand what firms especially the 'hidden' firms of sectors such as the hotel sector, are doing in reality in terms of their environmental management practices. The findings of the study can contribute to resolution of the conflict between maintaining productivity and considering the cost-benefit situation. For example, in order to be transparent to stakeholders, the firms, in general or the hotel sector, in particular, should consider disclosing their environmental problems and activities in their financial reporting or other special environmental reports and all the costs incurred in relation to environmental activities should be included in the budgeting system and disclosed clearly in reports. This action could affect the trusts of the stakeholders, but at the same time, it will enhance the credibility of the firm as it is shown to be able to manage the environmental problems in an appropriate way. Most probably, industry should carry out environmental activities according to government legislation and regulation.

### 8.3.3 Research Contribution

The integration of environmental management practice and the management control system is still relatively new to academics and researchers in the management field. Furthermore, as Schaltegger et al (2003) mentioned this integration is more challenging than other fields as this idea is to integrate two areas which are totally different in reality.

Also, the work of this area is interdisciplinary and cross-functional, so the use and development of theory from a variety of fields will be necessary to advance the body of knowledge. The current study employs the contingency theory to explain the research objectives mentioned in the earlier chapter because it is believed that contingency theory can explain the practice of management control system, as well as the environmental management.

Besides the main effect, the mediating and moderating effect of management control systems on the relationship between environmental management practice and environmental performance are also tested in this study.

This study also contributes to the methodological perspective where it employs a survey questionnaire to collect the data, followed by a small-group in-depth interview surveys to clarify the issues raised by the questionnaire survey results. This multi-method approach can avoid potential common variance biases and enhance the validity and reliability of the construct measures (Bisbe and Otley, 2004). Most of the

past studies employ questionnaire surveys or interview surveys, rather than a mixed method to answer research problems.

#### **8.3.4 Contribution to Regulatory and Policy Maker**

Currently, available environmental law and accounting standards worldwide do not compel companies to disclose environmental performance, and hence the companies are not obliged to show their responsiveness to the stakeholders. Similarly, to date, there is no statutory requirement in Malaysia requiring firms to disclose environmental information to the public (ACCA, 2005). This may be one of the reasons why hotels do not see the importance of environmental information systems in improving the environmental performance.

It is hoped that the Malaysian Accounting Standard Board (MASB) for reporting environmental issues will be made available soon and companies, in general and the hotel sector in particular will comply with these standards. The Malaysian Hotel Association (MAH) should cooperate with the government to introduce mandatory standards for the hotel sector. Even though not all types of industries, such as the hospitality sector (i.e. hotels) have significant environmental impacts (ACCA, 2005), with the standard, they can take steps to benefit the environment, whether through energy efficiency schemes, waste reduction strategies or the improved design of their in-house services and external purchasing systems. Therefore, even though the hotel sector does not feel they are directly exposed to environmental problems, they cannot run away from their responsibility and should be more responsive towards environmental issues.

#### 8.4 Assumptions and Limitations

There are several assumptions in the study. This study assumes that respondents know and understand the terms used in the study such as environmental management practice, management control system and environmental performance. Besides that, respondents also are assumed to have a clear understanding of the related terms used as the researcher attached these terms together with the questionnaire and defined the terms before interviews commenced.

There are number of limitations in this study. First, the sample frame is based on the hotel sector solely and is cross-sectional in nature. Future studies should attempt to incorporate a larger sample or conduct a time series study or compare results across various industries to increase the generalisability of the results. Furthermore, the accuracy and validity of the published environmental performance indicator is also one of the limitations to hinder the accurate interpretation of the results.

Further, the available data of 125 samples in the hotel sector may not be sufficiently large. Even though the data are adequate for statistical analysis for the current study and strongly support the reliability of the sample, caution must be exercised in generalising the findings. While structural equation modelling could be used in order to get clearer findings, it was not employed for reasons outlined in Chapter Five. Another potential limitation of the study is respondent bias. This is a common problem when collecting data using an interview-based approach.



Finally, the limitation of the timeframe of the study caused the approach used for data collection to be limited to a questionnaire survey and a phone-interview survey. Therefore, other approaches such as a case study method could not be used.

### **8.5 Future Research and Further Development**

Although this study focused on the influence of environmental management control systems on environmental performance, future research should consider how the hotel sector is monitoring and managing environmental activities and to identify best practice in order to improve environmental performance. This would entail the selection of key global exemplars of various types and scale of hotel operations in order to identify the best possible practice. This would include leading global hotel(s) such as,

- Apex Hotels United Kingdom, which has dedicated architect in charge of sustainable hotel design to ensure that its five city hotels aim to meet low carbon standards ([www.tourismpartnership.org/pages07/News.html](http://www.tourismpartnership.org/pages07/News.html))
- The Radisson SAS Hotel Tallinn, Estonia, which has been designed to minimise wastage and maximise resource efficiency ([www.tourismpartnership.org/pages07/News.html](http://www.tourismpartnership.org/pages07/News.html)),

The best environmental practice of the leading global hotels should also be a reflection for the hotel sector in Malaysia in order to implement appropriate practice to tackle the issues raised in this study. Therefore, it was proposed that further research enquiry in the area of the study could be extended in a number of directions.

- Since the real issue for the hotel sector is not about meeting minimum standards for environmental protection, but meeting best environmental practice in order to enhance environmental performance, the framework which is suggested in the current study could be extended with the identification of refined measures and indicators of environmental performance which might be used to augment the current findings. The accuracy and validity of typical environmental performance indicators and benchmarking in hotel sector should be addressed clearly in order to improve the hotel environmental performance. The approach to addressing its environmental issues could be, for example;
  - An assessment in regards of what improvement can be made, how much they cost and what types of changes in consumption or waste generation can be expected. The assessment can provide a baseline which change can be measured.
  - The possible department or individual who's responsible for achieving the targets are identified in an action plan.
  - The impact should be measured and documented.

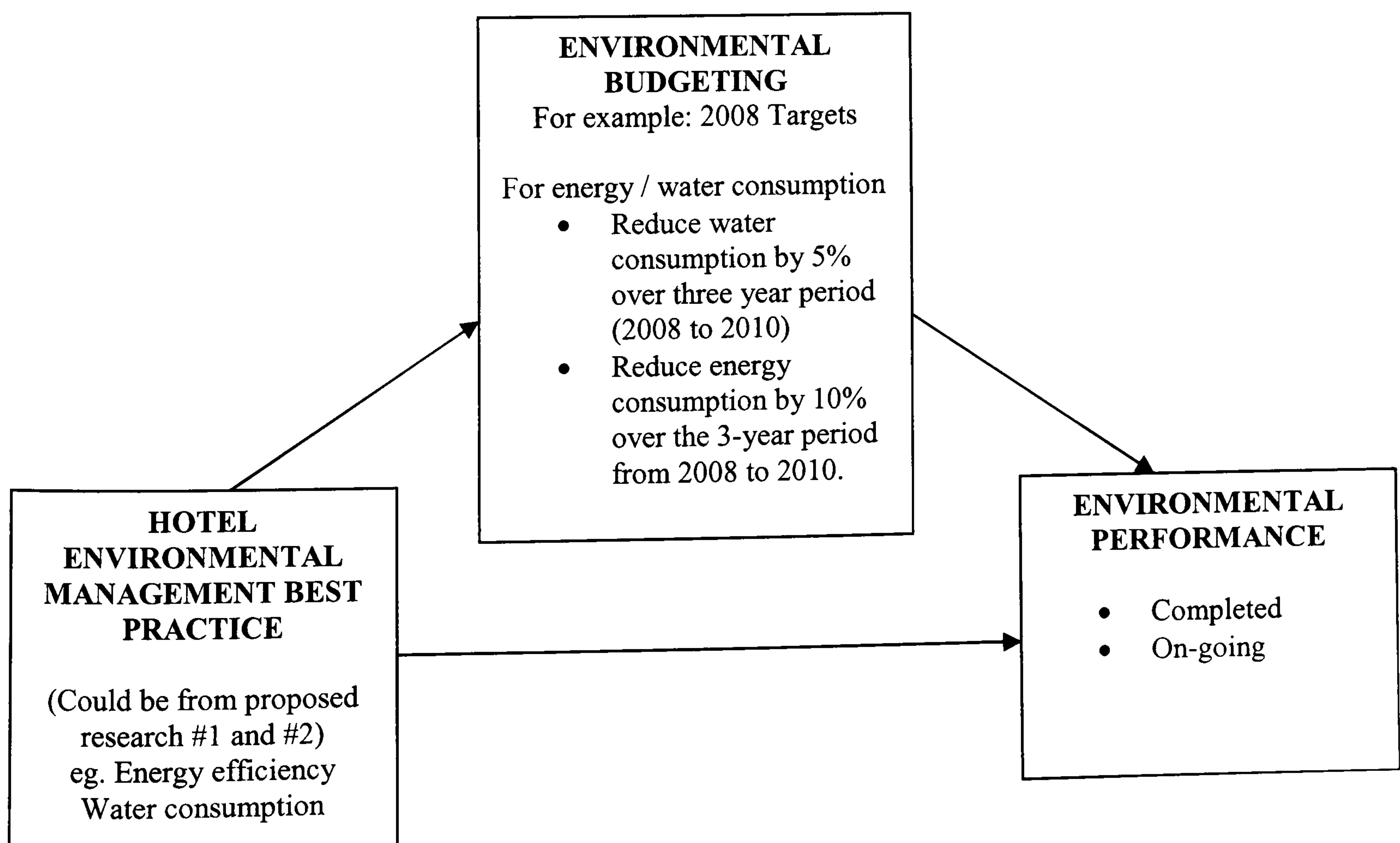
The aim really being to create an environmental performance model or environmental audit model, which summarizes the typical indicators such as energy use /misuse; water usage; food sourcing; heating etc. Therefore, the objective to upgrade the skills of Malaysian hoteliers who are expected to conduct the audits and advise on environmental performance could be achieved by having this proper model. For example,

<b>Hotel Environmental aspects</b>	<b>Examples of typical environmental performance indicators</b>	<b>The questions should be addressed (might be in the questionnaires –adapted from CERES’ GREEN HOTEL INITIATIVES BEST PRACTICE SURVEY)</b>
<b>Energy and Resource use</b>	<ul style="list-style-type: none"> <li>• Amount of energy consumption per year, per head or per unit of product</li> <li>• Amount of energy saved due to energy conservation programmes</li> </ul>	<ul style="list-style-type: none"> <li>• Is energy efficient lighting in place in your lobby, hallways, exit signs, public restrooms, guestrooms etc (please stated)?</li> </ul>
<b>Purchasing and Contracting (such as sourcing foods and raw materials)</b>	<ul style="list-style-type: none"> <li>• % of organisations’ supplier base that has a written environmental policy</li> <li>• Amount of hazardous materials used by contractors or suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Does your hotel give preference to products which are environmentally responsible, such as low toxicity, organic or locally made?</li> <li>• Does your hotel give preference to the selection of environmentally responsible service providers?</li> </ul>

- As mentioned before, the lower awareness and understanding of the benefits of implementation of good environmental management practice among Malaysian hotel sectors might be addressed by the introduction of Cost-Benefit Assessment in the future research. In order to develop greater awareness and understanding among Malaysian hoteliers, the case of environmental management best practices among leading hotels should be publicized through introducing environmental investment fund feasibility and financing, performance awards programs and international human resources exchange programs. International chains or big individual hotels could be a possible unit of analysis to conduct the study. For examples, in the issues of improving the quality of goods and services, a proactive hotel can improve its own productivity by implementing

best practices environmental management. However, the question whether the hotel can balancing their cost-benefit equation in adoption of environmental practices, such as seeking profit maximisation and cost minimisation at the same time could be raised in the future research by conducting field work study.

- With reference to environmental performance indicators, the environmental performance analysis should be linked to environmental performance milestones and targets. This would be supported by the relevant statistical data. As mentioned in the finding of the study, environmental budgeting is one of the management control system that have significant influence on environmental performance. When objectives or targets in the budget are not met, reasons for the failure and proposed corrective action would need to be discussed. The model to compare the budgeted and actual environmental performance is proposed as below and might be used in the future research.



- Since this study is limited to the hotel sector in Malaysia, future research could be conducted carrying out comparative studies between Malaysia and other countries, such as Asian countries or western countries. The comparison among groups could also be done using the proposed framework. The current study does not investigate practice among groups. The study only focuses on practice in general and does not identify hotels which have a proactive approach or other approaches. Therefore, the use of specific typology for environmental management practice and testing its relationship with environmental performance could be an area of potential research in the future.
  
- Since this study only used questionnaire and interview based approaches to collect the data, future research could extend the framework by using case study methods especially in the form of environmental audits and thus, a triangulation approach could be utilised. Finally, since this study only examines management control systems in the context of their extensive use and integration into environmental management practice, future research could attempt to see how the designing of management control systems affects the relationship between practice and performance from the environmental management perspective. Furthermore, different theories could be used to address the potential different implications of different specific control systems being selected for environmental management control systems such as the theory of constraint and the political cost economy theory could be utilised to enhance the contribution to knowledge within this area.

## 8.5 Concluding Comment and Summary

This study presented a description of selected elements of the management control system and their effect on the relationship between environmental management practice and environmental performance in the hotel sector. This study attempts to facilitate an understanding of the current state of environmental management practice in the hotel sector in Malaysia and at the same time, provides evidence of the importance of the management control system in the relationship between environmental management practice and environmental performance.

The most significant contributions have been discriminating between the main, mediating and moderating effects of the roles of the management control system on the relationship between environmental management practice and environmental performance. The consideration of hotel size, hotel structure and chain affiliation could be plausible factors to explain the effect of the management control system on the relationship.

To summarise, this research concludes that any selected management control system elements used in the environmental management perspective, should be contingent on the nature of the firms and the strategy or practice they are implementing. There was support for the contingency theory view which states that the management control system should be fitted to the firms' practice and strategy in order to enhance performance.

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## APPENDIX I: Factor analysis and reliability analysis

### Environmental management practice (EMPRACTICE)

Items in questionnaire	Factor 1	Factor 2
• The hotel is using an environmental plan. (EMPRACTICE 1)	0.898	
• The hotel is using a written document describing its environmental plan. (EMPRACTICE 2)	0.863	
• The hotel gives priority to purchasing ecological product (eg: biodegradable, reusable, recyclable etc).(EMPRACTICE 3).	0.876	
• The hotel stresses ecological issue when marketing its product.(EMPRACTICE 4).	0.858	
• The hotel makes a selective collection of paper, oil, glass etc for recycling purpose.(EMPRACTICE 5).	0.808	
• The hotel communicates its environmental plan to its shareholders. (EMPRACTICE 6)	0.859	
• The hotel communicates its environmental plan to its employees.(EMPRACTICE 7)	0.890	
• The hotel is establishing or has established an environmental, health and safety unit.(EMPRACTICE 8).	0.773	
• The hotel is developing a board or management committee or manager to dealing with environmental issues.(EMPRACTICE 9)	0.897	
• The hotel conducts environmental and awareness training program for its employees.(EMPRACTICE 10)	0.896	
• The hotel gives employees training about environmental issues.(EMPRACTICE 11).	0.872	
• The hotel organizes or sponsors environmental protection activities.(EMPRACTICE 12).	0.889	
• The hotel produces a separate report communicating the environmental costs and savings.(EMPRACTICE 13)	0.880	
• The hotel carries out an internal environmental audit.(EMPRACTICE 14)	0.903	
• The hotel has a written document describes its environmental audit.(EMPRACTICE 15)	0.900	
• The hotel quantifies its environmental savings and costs in budget.(EMPRACTICE 16)	0.822	
• The hotels facilities customers' collaboration in environmental protection (eg: voluntary changing towel etc).(EMPRACTICE 17)	0.846	
• The hotel has procedures to check and revise the environmental performance.(EMPRACTICE 18)	0.937	
• The hotel is relatively efficient in the use of energy, water and other material.(EMPRACTICE 19)	0.794	0.428
• The hotel reduces the use of environmentally toxic and dangerous products (eg: Hygiene chemical etc).(EMPRACTICE 20)	0.808	0.409
• The hotel applies water saving practices. (EMPRACTICE 21)	0.625	<b>0.735</b>
• The hotel applies energy saving practices.(EMPRACTICE 22)	0.652	<b>0.715</b>

	<b>Eigenvalue</b>	<b>15.761</b>	<b>1.831</b>
	<b>Cumulative variance %</b>	<b>71.640</b>	<b>79.964</b>
<b>AFTER REMOVAL EMPRACTICE 21 AND EMPRACTICE 22</b>			
• The hotel is using an environmental plan. (EMPRACTICE 1)		0.900	
• The hotel is using a written document describing its environmental plan. (EMPRACTICE 2)		0.63	
• The hotel gives priority to purchasing ecological product (eg: biodegradable, reusable, recyclable etc).(EMPRACTICE 3).		0.876	
• The hotel stresses ecological issue when marketing its product.(EMPRACTICE 4).		0.867	
• The hotel makes a selective collection of paper, oil, glass etc for recycling purpose.(EMPRACTICE 5).		0.806	
• The hotel communicates its environmental plan to its shareholders. (EMPRACTICE 6)		0.869	
• The hotel communicates its environmental plan to its employees.(EMPRACTICE 7)		0.887	
• The hotel is establishing or has established an environmental, health and safety unit.(EMPRACTICE 8).		0.763	
• The hotel is developing a board or management committee or manager to dealing with environmental issues.(EMPRACTICE 9)		0.906	
• The hotel conducts environmental and awareness training program for its employees.(EMPRACTICE 10)		0.908	
• The hotel gives employees training about environmental issues.(EMPRACTICE 11).		0.885	
• The hotel organizes or sponsors environmental protection activities.(EMPRACTICE 12).		0.901	
• The hotel produces a separate report communicating the environmental costs and savings.(EMPRACTICE 13)		0.886	
• The hotel carries out an internal environmental audit.(EMPRACTICE 14)		0.908	
• The hotel has a written document describes its environmental audit.(EMPRACTICE 15)		0.907	
• The hotel quantifies its environmental savings and costs in budget.(EMPRACTICE 16)		0.822	
• The hotels facilities customers' collaboration in environmental protection (eg: voluntary changing towel etc).(EMPRACTICE 17)		0.841	
• The hotel has procedures to check and revise the environmental performance.(EMPRACTICE 18)		0.950	
• The hotel is relatively efficient in the use of energy, water and other material.(EMPRACTICE 19)		0.769	
• The hotel reduces the use of environmentally toxic and dangerous products (eg: Hygiene chemical etc).(EMPRACTICE 20)		0.763	
	<b>Eigenvalue</b>	<b>15.010</b>	
	<b>Variance %</b>	<b>75.052</b>	
	<b>Cronbach alpha</b>	<b>0.982</b>	

## Environmental performance (ENVPERF)

Items in questionnaire	Factor 1	Factor 2
• The hotel's environmental objectives and targets have been achieved. (ENVPERF1)	0.881	
• The hotel has a good environmental reputation (ENVPERF2)	0.889	
• The hotel is relatively efficient in the use of energy, water and other materials (ENVPERF3)	0.776	
• The hotel has personnel with environmental protection training.(ENVPERF4)	0.865	
• The hotel has a stable relationship of cooperation with stakeholder (ENVPERF5)	0.868	
• The personnel is proud of the hotel's environmental behaviour (ENVPERF6)	0.899	
• The travel agencies and tour operator are satisfied with the hotel's measures in environmental protection (ENVPERF7)	0.937	
• The managing board is satisfied with the hotel's environmental behaviour (ENVPERF8)	0.926	
	<b>Eigenvalue</b>	<b>6.214</b>
	<b>Variance %</b>	<b>77.67</b>
	<b>Cronbach alpha</b>	<b>0.959</b>



## ENVIRONMENTAL MANAGEMENT CONTROL SYSTEM (EMCS)

### Interactive Control System (INTERACTIVE)

Items in questionnaire	Factor1	Factor2
• I am fully involved in setting the environmental policy for my area of responsibility (INTERACTIVE1)	0.865	
• I participate with other departmental managers in preparing the environmental policy for our hotel (INTERACTIVE2)	0.887	
• I have extensive influence on the environmental policy for my area of responsibility (INTERACTIVE3)	0.888	
• My contribution to the environmental policy for my hotel is not significantly important (INTERACTIVE4)	0.765	
• Other managers and I attend meetings on the meaning and importance of environmental management (INTERACTIVE5)	0.892	
• The management culture stressing on personal involvement in environmental management conducive in promoting employee trust (INTERACTIVE6)	0.857	
• The hotel does not permit me in establishing environmental improvement procedures in my area of responsibility (INTERACTIVE7)	0.754	0.440
• Generally, I know and understand the mission statement and environmental policy (INTERACTIVE8)		<b>0.815</b>
• Employees in this hotel have access to the information that could be used to create total quality environmental management charts and graphs (INTERACTIVE9)	0.879	
• Employees in this hotel are trained in TQEM (INTERACTIVE10)	0.847	
• Hotel uses diagrams of flow charts to highlight potential causes of environmental problems (INTERACTIVE11)	0.871	
• Employees in my hotel use several TQEM tools to eliminate or reduce controllable sources in the operating process (INTERACTIVE12)	0.869	
• Employees in my hotel do not receive training in improving the environmental in my organization (INTERACTIVE13)	0.751	
• Employee empowerment in decision making is practiced and encouraged (INTERACTIVE14)	<b>0.594<sup>86</sup></b>	
	<b>Eigenvalue</b>	<b>9.001</b>
	<b>Cumulative Variance %</b>	<b>73.228</b>

<sup>86</sup> The low communalities of INTERACTIVE 14 ( $h^2 = 0.362$ ) was used as a basis for deletion

## AFTER REMOVAL INTERACTIVE 8 AND INTERACTIVE 14

• I am fully involved in setting the environmental policy for my area of responsibility (INTERACTIVE1)	0.868	
• I participate with other departmental managers in preparing the environmental policy for our hotel (INTERACTIVE2)	0.889	
• I have extensive influence on the environmental policy for my area of responsibility (INTERACTIVE3)	0.897	
• My contribution to the environmental policy for my hotel is not significantly important (INTERACTIVE4)	0.763	
• Other managers and I attend meetings on the meaning and importance of environmental management (INTERACTIVE5)	0.894	
• The management culture stressing on personal involvement in environmental management conducive in promoting employee trust (INTERACTIVE6)	0.852	
• The hotel does not permit me in establishing environmental improvement procedures in my area of responsibility (INTERACTIVE7)	0.760	
• Employees in this hotel have access to the information that could be used to create total quality environmental management charts and graphs (INTERACTIVE9)	0.869	
• Employees in this hotel are trained in TQEM (INTERACTIVE10)	0.842	
• Hotel uses diagrams of flow charts to highlight potential causes of environmental problems (INTERACTIVE11)	0.873	
• Employees in my hotel use several TQEM tools to eliminate or reduce controllable sources in the operating process (INTERACTIVE12)	0.870	
• Employees in my hotel do not receive training in improving the environmental in my organization (INTERACTIVE13)	0.768	
	<b>Eigenvalue</b>	<b>8.605</b>
	<b>Variance %</b>	<b>71.712</b>
	<b>Cronbach alpha</b>	<b>0.964</b>

## Environmental budgeting and cost control (BUDGET)

Items in questionnaire	Factor 1	Factor 2
The hotel details up the costs of training employees in the budget.(BUDGET1)	0.668* <sup>87</sup>	0.568
The hotel details up the costs of studying environmental impact in the budget.(BUDGET2)	0.847	0.366
The hotel details up the costs of auditing environmental risks in the budget.(BUDGET3)	0.837	0.407
The hotel details up the costs of developing EMS in the budget.(BUDGET4)	0.850	0.399
The hotel details up the costs in cleaning up a polluted river or lake in the budget.(BUDGET5)	0.587	0.627 <sup>88</sup>
The hotel details up the costs in cleaning up oil spills in the budget.(BUDGET6)	0.704	0.530
The hotel details up the costs in cleaning up contaminated soil/land in the budget.(BUDGET7)	0.687*	0.577
The hotel details up the costs in settling personal injury claims from environmentally unsound practices in the budget.(BUDGET8)	0.888	
The hotel details up the costs in settling property damage claims in the budget.(BUDGET9)	0.688 <sup>89</sup>	
The hotel details up the costs in restoring land to its natural state in the budget.(BUDGET10)	0.882	
The hotel details up the costs in losing sales from a bad environmental reputation in the budget.(BUDGET11)	0.871	
The hotel details up costs in receiving medical care because of polluted air (individual welfare) in the budget.(BUDGET12)	0.830	
The hotel details up the costs in losing a lake for recreational use because of contamination (degradation) in the budget.(BUDGET13)	0.903	
The hotel details up the costs in losing employment because of contamination (individual welfare) in the budget.(BUDGET14)	0.893	
	<b>Eigenvalue</b>	<b>9.001</b>
	<b>Cumulative Variance %</b>	<b>1.877</b>
		<b>77.698</b>

<sup>87</sup> \*The basis of deletion of BUDGET1 and BUDGET7 is because their factor loading is less than 0.7.

<sup>88</sup> The basis of deletion of BUDGET5 is because this item does not in the similar common factor. Factor loading based on Principal Component Analysis and rotated solutions using VARIMAX.

<sup>89</sup> The communalities of BUDGET9 ( $h^2 = 0.531$ ) is low and was used as a basis of deletion.

## AFTER REMOVAL BUDGET 1, BUDGET5, BUDGET7, BUDGET9

The hotel details up the costs of studying environmental impact in the budget.(BUDGET2)	0.868	
The hotel details up the costs of auditing environmental risks in the budget.(BUDGET3)	0.851	
The hotel details up the costs of developing EMS in the budget.(BUDGET4)	0.857	
The hotel details up the costs in cleaning up oil spills in the budget.(BUDGET6)	0.763	
The hotel details up the costs in settling personal injury claims from environmentally unsound practices in the budget.(BUDGET8)	0.890	
The hotel details up the costs in restoring land to its natural state in the budget.(BUDGET10)	0.904	
The hotel details up the costs in losing sales from a bad environmental reputation in the budget.(BUDGET11)	0.891	
The hotel details up costs in receiving medical care because of polluted air (individual welfare) in the budget.(BUDGET12)	0.831	
The hotel details up the costs in losing a lake for recreational use because of contamination (degradation) in the budget.(BUDGET13)	0.895	
The hotel details up the costs in losing employment because of contamination (individual welfare) in the budget.(BUDGET14)	0.916	
<b>Eigenvalue</b>	<b>0.7383</b>	
<b>Variance %</b>	<b>73.837</b>	
<b>Cronbach alpha</b>	<b>0.96</b>	

## Environmental Information System (EIS)

Items in questionnaire	Factor 1	Factor 2
• Hotel in hospitality industries should be required by law to produce an audited environmental report annually (EIS1).	0.827	0.431
• Environmental audit is best described as a management tool and its use should be the discretion of management.(EIS2)	0.788	0.490
• Environmental audit is primarily a means of ensuring compliance with legislation.(EIS3)	0.767	0.313
• Environmental audit is primarily a means of identifying opportunities for improving environmental performance (EIS4).	<b>0.741<sup>*90</sup></b>	
• Environmental audit should be subject to a standard setting process defining the audit scope and the methodology used.(EIS5)	0.832	
• Terms such as environmental audit, environmental review and environmental impact assessment can be used interchangeably.(EIS6)	0.860	
• The scope and methodology of an environmental audit should be agrees between the auditor and the client and should not be predetermined by outside bodies.(EIS7)	0.814	
• Environmental audit is essentially a review of system and as such is similar to financial audit.(EIS8)	0.583	<b>0.654<sup>91</sup></b>
• Environmental audit is chiefly concerned with identifying the impact of the clients' operations on the environment.(EIS9)	0.443	<b>0.621*</b>
	<b>Eigenvalue</b>	<b>5.071</b>
	<b>Cumulative Variance %</b>	<b>72.463</b>

### AFTER REMOVAL EIS4, EIS8 AND EIS9

• Hotel in hospitality industries should be required by law to produce an audited environmental report annually (EIS1).	0.877	
• Environmental audit is best described as a management tool and its use should be the discretion of management.(EIS2)	0.844	
• Environmental audit is primarily a means of ensuring compliance with legislation.(EIS3)	0.810	
• Environmental audit should be subject to a standard setting process defining the audit scope and the methodology used.(EIS5)	0.824	
• Terms such as environmental audit, environmental review and environmental impact assessment can be used interchangeably.(EIS6)	0.848	
• The scope and methodology of an environmental audit should be agrees between the auditor and the client and should not be predetermined by outside bodies.(EIS7)	0.787	
	<b>Eigenvalue</b>	<b>4.156</b>
	<b>Variance %</b>	<b>69.265</b>
	<b>Cronbach alpha</b>	<b>0.912</b>

<sup>90</sup> \* The communality is low (EIS4 = 0.554 and EIS9 = 0.582)

<sup>91</sup> Factor loading for item EIS 8 is not common factor.

### Environmental culture control (CULTURE)

Items in questionnaire	Factor 1	Factor 2
Group	0.818	
Development	-0.818	
Hierarchical		0.796
Rational		-0.796
	<b>Eigenvalue</b>	<b>1.338</b>
	<b>Variance %</b>	<b>1.267</b>
		<b>66.897</b>
		<b>63.372</b>

### CONTROL VARIABLES

#### Environmental Structure (STRUCTURE)

Items in questionnaire	Factor 1	Factor 2
Specialization	0.925	
Task	0.905	
Decision	0.763	
Style	0.573	
Delegation	0.690	
	<b>Eigenvalue</b>	<b>3.095</b>
	<b>Variance %</b>	<b>61.910</b>
	<b>Cronbach alpha</b>	<b>0.836</b>

## APPENDIX II: THE QUESTIONNAIRE

### A. GENERAL INFORMATION

1. Name and address of the hotel:

--

2. Job Responsibility

- Senior management  1
- Production/operation  2
- Finance accounting  3
- Environmental department  4
- External/media relations  5
- Marketing sales  6
- Purchasing  7
- Human Resources  8
- Product Development  9
- Other (please specify)  10

6. Is the hotel part of an international chain?

Yes	<input type="checkbox"/> 1
No	<input type="checkbox"/> 2

If 'yes', go to the question no 7 and if 'no', go to question no 8.

7. How many hotel branches or chains in overseas?

--

3. E- Mail Address

--

8. Year of the hotel opening

--

4. Number of Guest Room (s)

--

9. Year the hotel involved in environmental management activities

--

5. Hotel Standard /Rating

- 5 Star  1
- 4 Star  2
- 3 Star  3
- 2 Star  4
- 1 Star  5
- No-Star  6

List any Quality International Standard achieved by the hotel.

- i. \_\_\_\_\_
- ii. \_\_\_\_\_
- iii. \_\_\_\_\_

**B. ENVIRONMENTAL MANAGEMENT PRACTICE**

10. Please state the degree of Environmental Management System (EMS) commitment in your hotel for the following area. (Please tick the appropriate answer) where 5 indicate a very strong commitment and 1 indicates a very little commitment)

- 1= very little commitment
- 2= little commitment
- 3= neutral
- 4= strong commitment
- 5= very strong commitment

	5	4	3	2	1
The hotel is using an environmental plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel is using a written document describing its environmental plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel gives priority to purchasing ecological product (eg: biodegradable, reusable, recyclable etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel stresses ecological issue when marketing its products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel makes a selective collection of paper, oil, glass etc for recycling purposes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel communicates its environmental plan to its shareholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel communicates its environmental plan to its employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel is establishing or has established an environmental, health and safety unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel is developing a board or management committee or manager to dealing with environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel conducts environment and awareness training program for its employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel gives employees training about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel organizes or sponsors environmental protection activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel produces a separate report communicating the environmental costs and savings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel carries out an internal environmental audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel has a written document describes its environmental audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel quantifies its environmental savings and costs in its budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel facilitates customers collaboration in environmental protection (eg: voluntary changing towel, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel has procedures to check and revise the environmental performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel is relatively efficient in the use of energy, water and other material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel reduces the use of environmentally toxic and dangerous products (eg: Hygiene chemical etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel applies water saving practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel applies energy saving practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**C. ENVIRONMENTAL MANAGEMENT CONTROL SYSTEM**

Please state the extent the following statement is true on the environmental management control system (EMCS) involvement in your hotel. (Please tick the appropriate answer)

- 1= completely not true
- 2= partly not true
- 3= neutral
- 4= partly true
- 5= completely true

**11. INTERACTIVE CONTROL SYSTEM (INTERACTIVE)**

	5	4	3	2	1
I am fully involved in setting the environmental policy for my area of responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I participate with other departmental managers in preparing the environmental policy for our hotel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have extensive influence on the environmental policy for my area of responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My contribution to the environmental policy for my hotel is not significantly important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other managers and I attend meetings on the meaning and importance of environmental management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The management culture stressing on personal involvement in environmental management conducive in promoting employee trust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel does not permit me in establishing environmental improvement procedures in my area of responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Generally, I know and understand the mission statement and environmental policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employees in this hotel have access to the information that could be used to create total quality environmental management charts and graphs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employees in this hotel are trained in TQEM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hotel uses diagrams of flow charts to highlight potential causes of environmental problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employees in my hotel use several TQEM tools to eliminate or reduce controllable sources in the operating process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employees in my hotel do not receive training in improving the environmental in my organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employee empowerment in decision making is practiced and encouraged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>12. BUDGETING CONTROL SYSTEM (BUDGET)</b>					
The hotel details up the costs of training employees in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs of studying environmental impact in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs of auditing environmental Risks in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs of developing EMS in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in cleaning up a polluted river or lake in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in cleaning up oil spills in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in cleaning up contaminated soil/land in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in settling personal injury claims from environmentally unsound practices in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in settling property damage claims in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in restoring land to its natural state in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in losing sales from a bad environmental reputation in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up costs in receiving medical care because of polluted air (individual welfare) in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in losing a lake for recreational use because of contamination (degradation) in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel details up the costs in losing employment because of contamination (individual welfare) in the budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**13. CULTURAL CONTROL SYSTEM (CULTURE)**

These questions relate to the type of your hotel. Each of these items contains four descriptions of your hotel. Please distribute 100 points among the four descriptions depending on how similar the description is to your hotel. None of the descriptions is any better than the others; they are just different. You may divide the points in any way you wish.

For example: In question 1; If your hotel A seems very similar to yours, B seems somewhat similar and C and D do not seem similar at all, you might give 70 points to A and the remaining 30 points to B.

**1. Institutional characteristic (please distribute 100 points)**

- a. Hotel A is a very personal place. It is like an extended family. People see to share a lot of them. \_\_\_\_\_
- b. Hotel B is very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks. \_\_\_\_\_
- c. Hotel C is very formalized and structured place. Bureaucratic procedures generally govern what people do. \_\_\_\_\_
- d. Hotel D is very production oriented. A major concern is with getting the job done. People are not very happy. \_\_\_\_\_

**2. Institutional leader (please distribute 100 points)**

- a. The head of hotel A is generally considered to be a mentor, a sage or a father or mother figure. \_\_\_\_\_
- b. The head of hotel B is generally considered to be an entrepreneur, an innovator, or a risk taker. \_\_\_\_\_
- c. The head of hotel C is generally considered to be a coordinator, an organizer or an administrator. \_\_\_\_\_
- d. The head of hotel D is generally considered to be a producer, a technician or a hard-driver. \_\_\_\_\_

**3. Institutional cohesion (please distribute 100 points)**

- a. The glue that holds hotel A together is loyalty and tradition. Commitment to this hotel runs high. \_\_\_\_\_
- b. The glue that holds hotel B together is commitment to innovation and development. There is an emphasize \_\_\_\_\_
- c. The glue that holds hotel C together is formal rules and policies. Maintaining a smooth-running organization. \_\_\_\_\_
- d. The glue that holds hotel D together is the emphasis on tasks and goal accomplishment. \_\_\_\_\_

**4. Institutional emphases (please distribute 100 points)**

- a. Hotel A emphasizes human resources. High cohesion and morale in the hotel are important. \_\_\_\_\_
- b. Hotel B emphasizes growth and acquiring new resources. Readiness to meet new challenges is important. \_\_\_\_\_
- c. Hotel C emphasizes permanence and stability. Efficient, smooth operations are important. \_\_\_\_\_
- d. Hotel D emphasizes competitive actions and achievement. Measurable goals are important. \_\_\_\_\_

**14. ENVIRONMENTAL INFORMATION SYSTEM**

<b>ENVIRONMENTAL AUDIT AND REPORTING</b>					
Hotel in hospitality industries should be required by law to produce an audited environmental report annually	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit is best described as a management tool and its use should be the discretion of management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit is primarily a means of ensuring compliance with legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit is primarily a means of identifying opportunities for improving environmental performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit should be subject to a standard setting process defining the audit scope and the methodology used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Terms such as environmental audit, environmental review and environmental impact assessment can be used interchangeably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The scope and methodology of an environmental audit should be agrees between the auditor and the client and should not be predetermined by outside bodies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit is essentially a review of system and as such is similar to financial audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental audit is chiefly concerned with identifying the impact of the client's operations on the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D. ENVIRONMENTAL PERFORMANCE**

Please indicate to which environmental management activities improve your hotels environmental performance for this variable? (Please tick the appropriate answer)

- 1= no improvement
- 2= little improvement
- 3= average improvement
- 4= strong improvement
- 5= very strong improvement

	5	4	3	2	1
The environmental objectives have been achieved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel has a good environmental reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel is relatively efficient in the use of energy, water and other materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel has personnel with environmental protection training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hotel has a stable relationship of cooperation with stakeholders (government, clients, suppliers etc) for environmental protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The personnel is proud of the hotel's environmental behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The travel agencies and tour operators are satisfied with the hotels' measures in environmental protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The managing board is satisfied with the hotel's environmental behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E. HOTEL STRUCTURE**

To what extent has authority been delegated to the appropriate senior managers for each of the following classes of decisions?

	Complete delegate				No delegation
	5	4	3	2	1
Development of new services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The hiring and firing of environmental managerial personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selection of large investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget allocations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pricing decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Which of the following best characterizes the specification of actual job tasks in your hotel?

	5	4	3	2	1	
No formal description of job tasks exists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Task are clearly specified with well established performance criteria

Does your hotel publish an employee's manual? No  Yes  (if yes, go to the following question)

How complete it is? \_\_\_\_\_ ( Say in number 1 to 5 where 1 is detailed descriptions of employee tasks and 5 is only the basic outlined) .

Most operating decisions are made at

	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
The lower managerial level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The senior executive level

The managerial styles (modes of decision making) of your hotel's senior managers are:

	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
Allowed to range from informal to very formal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Expected to conform to a uniform style

Could you please indicate whether you would be interested in participating in an interview survey concerning the above issues at a later date and provide your contact details.

I would / would not be interested in participating in an interview survey. (Delete as appropriate)

Contact details:

Thank you for your time. Please provide your name and address below if you would like to receive a copy of the results or forward your address either by e-mail or under separate cover for a copy of the results.

Name:

Address:

E-mail Address:

**MANY THANKS FOR YOUR FEEDBACK**

**RN:**

## APPENDIX III: INTERVIEW QUESTION LIST

### Part A:

1. What is the most significant environmental problem to the hotel's sector?
2. Does the hotel sector know that their activities contribute to environmental problems? Why?

### Part B:

3. What environmental management activities carried out to improve environmental performance? (Guidance)
  - Waste audit
  - P2 Plan
  - Employee P2 training program
  - TCA
  - P2 incentive program
  - Manager for P2
  - R & D
  - P2 for suppliers
  - LCA
4. Does environmental activities such as audit, EQMP, environmental accounting and pollution prevention technique are actively used in the hotel? Which one do you think contribute much? Why?
5. What motivates hotel to employ environmental management practice mentioned in question 4? Explain.
  - Regulation by government
  - Rewards by hotel sector
  - Acknowledge by customer
  - Others. Identify
6. What strategy of environmental management hotel think they employ?

### Part C:

7. Do you think employee involvement and top management are important to your hotel? Why (try link with the environmental issues)
8. Do you think firm structure and firm culture are important to your hotel? Why? (try relate with the environmental issues)
9. Do you think const control is important to your hotel? Why? (try relate with the environmental issues)

### Part D:

10. What are the reasons for not adopting environmental management practices?
11. What are the problems facing hotel sector to employ the environmental management practice?
12. Do you think to implement the environmental management in your hotel will incur a lot of cost?

Demographic:

No of rooms:

Star rating:

Hotel chain affiliation: Yes/ No. If yes (state) International/local