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Usage of and Satisfaction with Accounting Information Systems in the Hotel Industry: The Case of Malaysia

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Abstract

In the last 20 years, organisations have invested heavily in Information Technology (IT) to support their businesses. The work systems of organisations nowadays are increasingly IT-enabled. The tourism industry in general and hospitality industry in particular is one of the industries that are much affected by the revolution of IT. There have been made various calls for additional research to improve knowledge about the usage of and satisfaction with information systems (IS) in organisations. This study is motivated by the lack of knowledge of the use of Accounting Information Systems (AIS) in the hotel industry, especially in developing countries. Thus, this research attempts to fill a knowledge gap by exploring the adoption of AIS and the factors that influence usage of and satisfaction with the AIS, as well as the relationship between satisfaction with the AIS and its organisational impact, in Malaysia. This study uses an extension of the Technology Acceptance Model (TAM) which is regarded as one of the most influential research models in explaining IT usage or acceptance behaviour in various contexts.

The research adopts a triangulation approach combining both a survey and interviews. The data from the survey were collected through a postal questionnaire to senior accounting managers in three, four and five star rated hotels. The data were analysed using Partial Least Squares (PLS) which is the PLS-Graph Beta Version 3.0. Semi-structured interviews with managers in six hotels supplement the findings from the survey. The interviews explained further, managers' insights into experience and views as a means to triangulate the research.

The findings confirm the wide use of computerised accounting systems in three, four and five star rated hotels, although, the extent of the AIS use is relatively unsophisticated with the focus on basic accounting modules and fundamental accounting-based applications. The main factors to influence perceived usefulness (PU) are perceived ease of use (PEOU), involvement and training. The factors that influence PEOU are experience, external expertise and PU. It is found that usage of the AIS, PU and PEOU significantly influence satisfaction with the AIS. This study also provides positive support for a relationship between satisfaction with the AIS and organisational impact. Despite the widely held belief that IT is fundamental to a firm's survival and growth, previous studies struggled to link IT to organisational impact.

This research adds to existing studies about the usage of and satisfaction with IT/IS. It provides further support to the TAM in terms of AIS in the hotel industry. The findings from this study also provide awareness to academics and practitioners about the importance of IT/IS in general and AIS in particular to create competitive advantages and to improve firms' efficiency and effectiveness, as well as to impact to overall firm performance.

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CHAPTER ONE
Introduction

1.0 Introduction

Accounting information guides the whole operation of an organisation by evaluating previous performance, controlling current operations and forecasting future operations and outcomes. The use of information technology (IT) improves the functions of recording, processing data, reporting and other aspects of accounting information through the accounting information systems (AIS). Without the AIS organisations cannot efficiently and effectively report results of their operations to many users internally and externally (Wilkinson et al., 2000). The internal users, especially managers, may make inappropriate decisions due to lack of accounting information and this may place in jeopardy the whole future of the organisation. An organisation requires accounting information produced by the AIS to enable it to manage and control its financial and other resources. This thesis explores the factors which contribute to the use of and satisfaction with AIS, its ultimate success in the hotel industry and its organisational impact.

Hotel industry is chosen because it is an important sector to Malaysia. Besides that, one specialism of the university where the researcher engaged with is tourism. Therefore, the thesis enables the researcher to contribute data to Malaysia economy and university mission. Also, in this current study and the title, the word ‘satisfaction’ is used to show the success of the system. It is a critical issue in the IS management to measure the effectiveness or success of IS. Thus the concept of user satisfaction as a surrogate for system success has been long used in the literature (Cyert and March, 1963; Locke, 1976; Bailey and Pearson, 1983; Doll and Torkzadeh, 1988). There is a lot of IS or AIS

software in the market, however not all the systems are good, therefore, IS that satisfies users' need is a determinant of the success of a system.

The chapter begins by addressing the academic motivation for the study and the importance of AIS. It also deals with issues related to technologies and internet use in the tourism industry in general and the hospitality industry in particular. It then continues with the research objectives and questions, followed by a brief explanation of the flow of the thesis.

1.1 Motivation and Background - The Importance of Accounting Information Systems (AIS)

AIS is the application of IT to accounting systems. AISs are collections of raw and stored data (input), processing method (normally called "procedures"), and information (output) that serve useful accounting purposes (Bagranoff et al., 2008). Bodnar and Hopwood (2004, p. 1) agree that AIS is 'a collection of resources, such as people and equipment, designed to transform financial and other data into information'. The term AIS is broad to include (1) transaction processing cycles; (2) the use of IT; (3) and the development of IS (which consists of systems analysis, systems design and systems implementation). The information produced by the AIS is communicated to a wide variety of decision makers.

The main role of accounting is to provide information to interested parties inside and outside the organisation. External users are more interested in accounting information from a financial accounting perspective that provides information mainly on the financial position, financial performance and position changes. Among these users are

stockholders, investors, creditors, government agencies, customers, vendors, competitors, labour unions, and the public at large. They utilize an organisation's financial statements such as balance sheets, income statements and cash flows statements to evaluate past performance, predict future performance and gain other insights into an organisation. Accounting information from the AIS has become a powerful tool in the hands of interested and appropriate parties which provides accurate, useful and quality information for knowing the state of an organisation.

The internal users are managers and staff, whose requirements depend on their position in an organisation and the particular function they perform. There are different information needs and demands at different managerial levels in an organisation. AIS produces information on the structure and dynamics of the organisation's wealth, financial position and results of the operations. The management of the organisation requires the AIS information on which to base decisions for long and short term strategies, necessary to achieve their objectives. Management or cost accounting produced by the AIS is an important source of information that shows important aspects of economic activities of an organisation. Cost accounting has information that gives power to the right decisions and that is tailored to the needs of the internal users.

Accounting information from the AIS is also used to control managers. This includes checking on how material and financial assets of a company are stored, used and managed by the managers. The AIS summarizes and filters the data available to decision makers. An organisation comprises many decision making units. By processing data, the AIS influences organisational decisions. Internal users are more interested in management accounting which provides information on costs and results of various

activities, budgeting of the internal activities etc. Thus, the use of accounting information from the financial accounting and management accounting produced by the AIS is very important to internal users. All information from both views undertaken by the accounting department will be processed by the management of an organisation to improve business activities and grow performance. Information produced by the AIS is important to users when the users can use the information needed on time, and can depend on this information to make important decisions and explore all the possibilities to assure the business' survival and economic stability.

To be competitive organisations depend on information and to stay competitive productivity is important. This can be increased through better IS. The term IS suggests the use of computer technology in an organisation to provide a wide range of information to users. Thus the use of AIS by an organisation compared to manual accounting systems helps to improve its effectiveness in recording and processing economic data to provide useful information to its users. It is vital for an organisation to have a good AIS to enable the business to process economic data into accounting information faster and more effectively in order to create competitive advantage. Compared to manual accounting systems, AIS permit users to interpret accounting information more effectively and efficiently, to provide practical solutions to reduce costs and streamline business activities (Ham et al., 2005).

Studies about the use of IS have found that usage of IS influenced satisfaction with the system (Rouibah et al., 2009; Baroudi et al., 1986). AIS is one part of the whole IS in any organisation; thus usage of the AIS could influence satisfaction with the AIS too. Satisfaction with the IS was used as a surrogate measure of IS success in most previous

studies dealing with IS success (Shaw et al., 2003; Gatian, 1994; Doll and Torkzadeh, 1988). Studies of various aspects of IS (e.g.: online shopping, electronic service, electronic commerce, electronic learning) found that when users are satisfied with the IS, they will continue using the system or extend their use of the system (Cheung and Lee, 2011; Roca and Gagne, 2008). An interesting question is whether AIS users also continue using the AIS when they are happy with the performance of the AIS when it satisfies their needs.

Successful implementation of IT/IS and AIS are important for an organisation because effective IT and AIS helps the organisation to increase productivity, create competitive advantage, make cost savings over time and increase revenue (Ham et al., 2005). Thus successful IT and AIS could lead to greater satisfaction of users of the systems and in turn influence the overall operations of an organisation and thus impact performance.

Accounting people cannot avoid the internet in their routines. 'It is nearly impossible to discuss accounting information systems without also discussing the internet and electronic commerce' (Bagnaroff et al., 2008, p. 374). Nowadays, many business transactions are conducted over electronic networks, that is, over groups of computers linked together electronically. One of the most important uses of the internet is for electronic commerce (e-commerce). The terms e-commerce and e-business are often used interchangeably. E-commerce involves buying and selling electronically, whereas, e-business allows companies to link their internal and external processes more efficiently and effectively, and work more closely with suppliers and partners to better satisfy the needs and expectations of their customers, leading to improvements in overall business performance. E-commerce enables various types of electronic payment

systems to exist on the internet. As more organisations conduct at least some business on the internet, it is increasingly important for accounting managers and staff to recognize the use and importance of the internet, and how to manage it.

The whole world has been impacted by technologies such as the internet, personal computers and wireless networks. Business operations are constantly altered by an ever increasing reliance on IT systems and this will continue into the future (Hospitality Technology, 2003). The use of the internet cannot be ignored in the tourism industry. Indeed it has dramatically changed the structure of the industry (Buhalis, 1998). The travel and tourism industries should use all available opportunities from internet resources to reach a diversity of users (Walle, 1996). Technologies link consumers with tourism products, as consumers can search for the products online and make bookings and payments online. Thus, the need to adopt innovative methods is becoming crucial to the tourism industry to enhance its competitiveness. The use of IT to increase efficiency and productivity, as well as to enhance strategic and operations management is vital.

The role of IT has also changed the landscape of the service industry over the past decade (Connolly and Sigala, 2001). IT is effecting significant changes in the hospitality industry (Connolly and Olsen, 2000). Customers and hotel practitioners demand more intensive information, which forces hotel companies to adopt computer-based IT and AIS facilities to improve operational efficiency, reduce costs and enhance service quality (Cobanoglu et al., 2001; Camison, 2000; Siguaw and Enz, 1999; Van Hoof et al., 1996). Hotel managers in the 21st century face a new challenge to integrate the new, complex and varied services and IT systems into their existing business operations to provide the high profile and 'high-tech' services demanded by

sophisticated hotel guests (Law and Jogaratnam, 2005). Almost all organisations are affected by IT regardless of the industry, location or size (Bradley et al., 1993; Clemons and McFarlan, 1986; McFarlan, 1984).

1.2 The Research Location

The empirical work for this research was undertaken in Malaysia, the author's home country. Malaysia, a developing country (see Appendix 1 for characteristics of developing countries and a table comparing Malaysian statistics with other three developing countries), is focusing strongly on the ICT based environment where business activities are oriented to the use of technology. In 1996, a Multimedia Super Corridor (MSC) was established by the government to start the creation of sophisticated and advanced IT. The use of the more sophisticated technologies will change business activities with a borderless and paperless environment. Government agencies are encouraged to use IT on the way to change to an e-government status. The government's aspiration, to become a fully developed nation by year 2020, must be supported by the private sector working and moving together with the government.

One of the Prime Minister's goals was to transform the Malaysian economy from one focused on manufactured exports to a service sector dominated economy, because of the tremendous scope for growth offered by the service industry. To achieve that, the country needed to increase the contributions of the service sector from its current level of 54% of GDP. With initial projections of the economy for Vision 2020, the contribution of the services sector to GDP is expected to increase to 60% (The Central Bank of Malaysia, 2008).

The importance of the tourism industry to the Malaysian economy provides an ideal location to investigate the impact of the AIS. The hotel industry is a major contributor to the revenue of the tourism sector. According to the Central Bank of Malaysia, in 2009, the tourism industry contributed a total of Ringgit Malaysia (RM) 55 billion in terms of foreign earnings, which constituted 8.2% of gross domestic product (GDP). It was the second highest contribution to foreign earnings after manufactured goods, with RM430.6 billion. The revenue received from the tourism industry in 2009 increased by 7.7% from 2008. Despite the global economic uncertainties, Malaysia received 23.65 million tourist arrivals in 2009, which was an increase of 7.2% from 22.2 million tourists recorded in 2008. The continued increase and success of tourism is shown in Table 1.1 below.

Table 1.1: Tourist arrivals and receipts (Source: Tourism Malaysia)

Year	Arrivals (Mill)	Receipts (RM)
2007	20.1	44.5 billion
2008	22.05	49 billion
2009	23.65	55 billion
2010	24.6	59.4 billion

In 2009, expenditure on accommodation remained as the major contributor to the tourism industry; this constituted 31.1% from the whole of the components of tourist expenditure. The total picture of the tourist expenditures for 2009 and 2008 is shown in Table 1.2.

Table 1.2: The components of tourist expenditure (Source: Tourism Malaysia)

Items	2009 (%)	2008 (%)
Accommodation	31.1	30.9
Shopping	28.3	26.6
Food and beverages	17.4	18.1
Local transportation	9.8	10.0
Domestic airfares	4.3	4.9
Organised tour	4.3	4.4
Entertainment	3.0	3.1
Miscellaneous	1.8	2.0

The latest list of the hotels and apartments provided by the Malaysian Association of Hotels is shown in Table 1.3.

Table 1.3: The list of hotels and apartments as at February 2012 (Source: Malaysian Association of Hotels)

Star rating	Hotel	Apartment
5	89	2
4	139	7
3	219	13
2	261	-
1	190	-

1.3 Problem Statement

The tourism industry in general and hospitality industry in particular is a very important contributor to the Malaysian economy. With the government support to further increase the quality of the whole industry, the implementation of IT is one of the principal components of success in the sector. Successful implementation of IT is crucial because with effective IT and internet-based technologies, hospitality companies can achieve substantial cost savings and increase productivity and revenue over time (Ham et al., 2005). The accounting information system (AIS) is part of the whole IT system and is very important to the accounting department and to management in general. The reports generated by the AIS are required by all managers in all departments within a hotel. The hotel managers rely on those reports in making most of the important management decisions.

However, with an increased dependence on IT/IS and AIS, in the hospitality industry, one of the most critical issues for management to assess is the success and effectiveness of IT within organisations. IS can be viewed in many ways therefore a number of system success measures exist such as cost-benefit analysis, system usage and the most widely used measure, end-user IS satisfaction. In any measurement of IS success, the

impact on end-users is one important dimension that should be included (Au et al., 2002). The realization of benefits from an IS depends upon the way the user chooses to respond to the system in market driven firms (Melone, 1990) and whether the user is satisfied with the IS is critical in determining whether it is effective or not (Au et al., 2002).

The complexity of IS/IT and indeed AIS acceptance has become an important issue for academic researchers and practitioners over the world (Legris et al., 2003). Previous studies (Burton-Jones and Hubona, 2006; Amoako-Gyampah and Salam, 2004; Hu et al., 2003; Venkatesh and Davis, 2000) verify various external variables that are believed to affect the usage of and satisfaction with the IS. Davis et al., (1989), in their development of the Technology Acceptance Model (TAM), proposed that external variables can affect the attitude and behaviour of users in acceptance of IS.

Prior IS research (e.g.: Rouibah and Hamdy, 2009; AlGahtani and King, 1999; Igbaria et al., 1997, 1995)has shown that usage is often influenced by ease of use and by perceived usefulness of the IS; it is claimed that these will inevitably affect both the use of, and the satisfaction with, the system (e.g.: Rouibah, 2008; Liu et al., 2006; Adamson and Shine, 2003; Mahmood et al., 2000).Various external variables have been identified in earlier studies (e.g.: Rouibah et al., 2009; Shang et al., 2005; Amoako-Gyampah and Salam, 2004; Hong et al., 2002; Venkatesh and Davis, 2000) to influence usefulness and usage of IS. These include the sophistication of the IS, the extent of staff involvement in systems design and selection of the IS and any perceived support of top management for the system. Likewise IS staff may be influenced in their judgements about the IS by their past experience, by the particular expertise they have acquired in previous IS roles

and by any training they have received in their current role. All the above factors might have a bearing upon and influence the successful manner in which the AIS is seen to operate.

Since IT is of such importance in running a business, numerous studies have been conducted to investigate its productivity. However, there is no documented research on the satisfaction of using IS/IT and AIS with regard to the hotel industry. There is also a lack of information about external variables that could influence the use of and satisfaction with IT/IS and AIS in the hotel industry in Malaysia, a developing country. Information is also scarce on how satisfaction with the AIS could impact the hotel companies' performance. Most of the findings on the relationship between IS/IT usage and satisfaction with it are based on research in technologically developed countries (e.g.: Lee et al., 2009; Adamson and Shine, 2003; Al-Gahtani and King, 1999; Gelderman, 1998; DeLone and McLean, 1992), with the exception of a few studies in less developed countries (Rouibah et al., 2009; Al-Gahtani, 2004; Aladwani, 2002; Khalil and Elkordy, 1999).

1.4 Research Questions

The following two objectives were used to guide the research process for this study. The objectives are to assess the factors influencing AIS usage and to measure the impact of AIS usage in the hotel industry. The research questions relating to these objectives are shown below:

1. What is the status of AIS adoption among the hotel industry in Malaysia?
2. What are the external factors that contribute to the *perceived usefulness* and *perceived ease of use* of the AIS?

3. To what extent does *perceived usefulness* impact *usage* of and *satisfaction* with the AIS?

4. To what extent does *perceived ease of use* impact *usage* of and *satisfaction* with the AIS?

5. Does *usage* influence *satisfaction* with the AIS?

6. Is AIS *satisfaction* correlated with *AIS impact*?

1.5 Contributions of Study

An appropriate indicator of the success of the use of AIS, along with other IT/IS, is that it supports the organisation to compete in the market. AIS offers many new technologies to use in running the business efficiently, especially in decision making processes and therefore all businesses, whether small or large, can benefit from using these technologies. Even though computer systems are not new to the Malaysian environment, most users, especially small and medium-sized companies are still running basic transaction-based systems.

Given its objectives, the study will be useful in the following ways:

- One of the distinctive contributions of this study to the field of accounting and IS, is the exploration of the usage of and satisfaction with the AIS. Various other studies have investigated user's usage and satisfaction with IS, decision support systems, software packages in general, office automation, the internet etc.

- Only a few studies (Choe, 1996; Thong et al, 1996) attempted to examine the external factors that contribute to the usage of and satisfaction with the AIS. Therefore, this study attempts to fill the gap by giving insights into the various

external factors that affect the usage of and satisfaction with the AIS in the specific context of hotel industry.

- Whilst studies have investigated the usage of and satisfaction with the IS, very few have attempted to examine the relationship between IS satisfaction and performance. This current study will examine the relationship between AIS satisfaction and organisational impact.

- The identification of factors that influence AIS usage and satisfaction will extend our current understanding of how effectively IT planning is carried out in the hotel industry. Such findings are necessary for the eventual development of effective IT in general and AIS in particular with regard to the systems strategies for the hotel industry.

- This research will further enrich the validation of measurement of user acceptance and satisfaction. The TAM developed by Davis et al. (1989) to measure computer acceptance has been used by many researchers to test and validate the measurement of IS acceptance. The DeLone and McLean Model (2003) of IS satisfaction is also well researched. The findings of these studies provide support for the surrogate measure of effectiveness or success of IS within an organisation.

- There are few studies of accounting practices and IT adoption in Malaysia, particularly in the hotel industry. Most of the existing studies are based on countries such as United States, United Kingdom, Canada, Australia, Hong

Kong and China. The pursuit of IT in various regional countries is diverse and the use of IT also varies tremendously within different countries. Thong (1999) stated that there are many differences between developing countries like Malaysia and developed economies. Therefore, it would be interesting to compare the findings of one part of the world to those of other parts.

- The findings of this study will be of interest to agencies in Malaysia such as the Malaysian Association of Hotels (MAH), Ministry of International Trade and Industry (MITI), Malaysian Industrial Development Authority (MIDA), Tourism Malaysia and other related bodies which are responsible for development of IT and the hotel industry in Malaysia.

1.6 Outline of the Thesis

Following this introduction, Chapter Two deals with the literature outlining the previous research pertaining to the themes covered in this current study. It then continues by focusing on the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA) which are applicable to the study. Following from this, the model and the hypotheses for the study are developed.

Chapter Three discusses the research methodology and data collection approach used in the study. The research paradigms available are outlined before the reasons why a predominantly quantitative approach is adopted. It then follows with consideration of the survey instrument and the data collection phase. Finally, the statistical methodology of PLS data analysis is discussed.

Chapter Four involves a descriptive analysis of the data used in the study; the profile of the respondents and their hotels are described. It continues by dealing with missing data, outliers and assumptions, as these are critical for the validity and reliability of the results generated.

Chapter Five deals the validation of the measurement model which is required by PLS. The chapter continues with the testing of the measurement model for the internal dynamics, external factors and organisational impact items.

Chapter Six concerns the assessment of the conceptual model using PLS to test each of the hypotheses. Within the chapter, additional tests are also performed.

Chapter Seven reports the interviews with six of the respondents to obtain a richer understanding of the topic. This is used as a confirmation of the results of the survey.

Chapter Eight discusses the results generated from assessing the structural model and additional robustness tests. It also includes insights from the interviews. The findings are also linked to the relevant academic literature.

Chapter Nine discusses the implications of the results and the conclusions which are drawn from the study. These are followed by the limitations of the study and identification of areas for future research.

1.7 Summary of the Chapter

This introduction chapter sets out the motivation of the study. It provides reviews about the research location and problem statements. This chapter also outlines and justifies the objectives of the study and posed the research questions. Then, contributions of the study were listed. Overall, this chapter describes the context in which the study was undertaken and outlines the structure of the whole thesis.

CHAPTER TWO
Literature Review

2.0 Introduction

As this research centres on the usage of and satisfaction with AIS, this chapter will explain the components of interest, review previous studies in the area and establish a framework for subsequent investigation. Central to this study are: Information Technology (IT) which refers to the hardware and software used in a computerized; and Information System (IS) or computer-based IS, which is the use of computer technology in an organisation to provide information to users; in this context it is a collection of computer hardware and software designed to transform data into useful information. The terms IS and IT are sometimes used interchangeably (Bagranoff et al., 2008).

Accounting Information Systems (AIS) have various definitions. Hall (2008), for example, defined AIS as a sub-system of management information systems. For the purpose of this study, AIS will be defined as a computer-based system that transforms an organisation's business events into accounting information for internal and external users. The major function of the AIS is to process financial and non-financial transactions. There are four major sub-systems of AIS, which are: (1) the transaction processing system which supports daily business operations with numerous documents and messages for users throughout the organisation; (2) the general ledger/financial reporting system which produces the traditional financial statements, such as income statements, balance sheets, statements of cash flows, tax returns, and other reports required by law; (3) the fixed assets system which processes transactions pertaining to the acquisition, maintenance, and disposal of fixed assets; and (4) the management reporting system which provides internal management with special purpose financial

reports and information needed for decision making, such as budgets, variance reports, and responsibility reports (Hall, 2008).

There are many types of AIS in the market; among those which are popular in the hotel industry are Hotel Information System (HIS), SUN accounting system, quickbook, UBS, IFCA, Fidelio opera system, biztrack accounting system, accounting package (ACCPAC) and System Application and Product (SAP).

2.1 IT and AIS in Hotel Operations

In hotel businesses, IT starts when customers are looking for products and ends when the customers have fulfilled all their needs. Therefore, in a hotel, IT starts and ends with customers (Watkins, 1995). Thus, hotels can benefit from the investment in IT if hotel staff work more efficiently with IT to better assist customers and customers also have a better experience with the hotels, as noted by Law and Jogaratnam (2005). In their survey in Hong Kong hotels, they found IT was used to replace the existing paper-based system, to improve customer service and to enhance operational effectiveness (Law and Jogaratnam, 2005).

The hospitality business is about providing accommodation, foods and other services to customers and therefore the operations of hospitality focus on how organisations go about delivering their products/services to the customer. Accommodation and foodservice are two different kinds of operations and thus it is essential to differentiate between the two. Johnson (1987) has proposed the concept of three main types of operation which are product processing operations, customer processing operations and information processing operations. An accommodation operation is predominantly ‘a

customer processing operation'. This kind of operation requires very little product and information processing. On the other hand, a foodservice operation is a product processing operation related to meals, which require a 'meal experience' for customers (customer processing element) and also some limited information processing (Jones, 1996).

Medlik and Ingram (2000) stated that hotels provide accommodation for those who are away from home and that becomes the primary function of a hotel. Providing sleeping accommodation is also the most distinctive hotel product. They point out that hotels have three main activities, which are: (1) earning from the sleeping accommodation or room revenue; (2) hotel reception, uniformed services (servicing arrivals and departures); and (3) housekeeping.

The food and drink service is another major activity in a hotel. This activity requires more employees than the sleeping accommodation because dealing with food is relatively labour intensive. Hotels supply food and refreshments to their resident guests as well as to non-residents and thus, sales from food supply are also a major source of income to hotels (Medlik and Ingram, 2000).

Hotel operations need IT crucially and thus IT development is very important for effective hotel operations in the 21st century (Winston, 1997) with the primary role of IT in the lodging industry being to improve productivity (Ham et al., 2005). The hospitality industry needs IT to improve operational efficiency, reduce costs and enhance service quality. Previous studies have shown a positive influence of the use of IT on the development of competitive advantage for the hospitality industry (e.g.: Cho

and Olson, 1998; Clemons, 1986; Porter, 1985; McFarlan, 1984). Studies by Ham et al. (2005) and David et al. (1996) concluded that investment in certain back office applications may not contribute to the improvement of hotels' performance within the short-term period but is expected to improve performance in the long-run.

According to Whitelaw (2008), to use IT effectively, managers need to be proficient at understanding IT and its capabilities and limitations. Using IT does not mean that the traditional hospitality management is taken over, but IT helps managers and other users to manage work more efficiently. Connolly and Olsen (2000) argued that the use of IT requires more investment capital and organisations become more dependent on IT, which has a greater impact on the organisation. Thus, IT and the business are merged and it is far more difficult nowadays to distinguish between technology decisions and business decisions.

Executives of finance, human resource, operations and marketing need to be proficient in IT or they cannot take full advantage of the benefits offered by the IT. The importance of IT in the organisation cannot be ignored and thus, they need to take IT into consideration when making important company decisions (Connolly and Olsen, 2000). Hence, IT has a boundary-spanning role as illustrated in Figure 2.1.

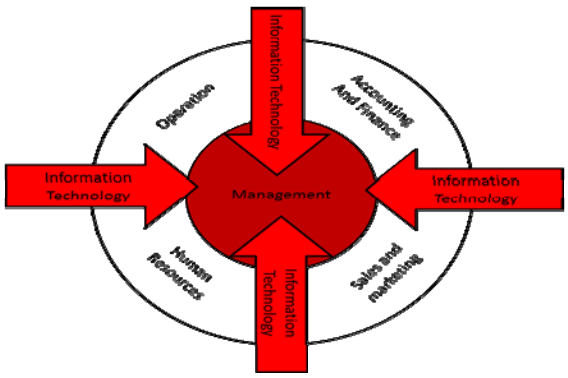


Figure 2.1: IT as the Boundary Spanner (Source: Connolly and Olsen, 2000)

AIS is a unified structure within an entity (Wilkinson et al., 2000). All the financial and non-financial economic data occurring in an organisation will be transformed into accounting information, in order to satisfy the information needs of a variety of users. AIS is, in large part, the application of IT to accounting systems and Figure 2.2 suggests that AIS stand at the crossroads of two disciplines: accounting and information systems and thus AIS are often viewed as computerized accounting systems (Bagranoff et al., 2008).

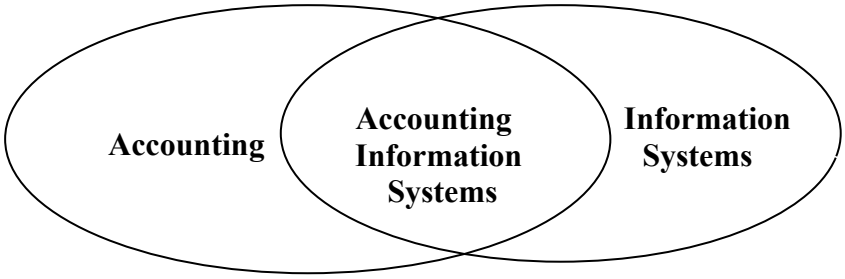


Figure 2.2: AIS Exists at the Intersection of Two Important Disciplines i.e. Accounting and Information Systems (Source: Bagranoff et al., 2008)

The accounting department in a hotel will assist other departments regarding the appropriate procedures that should be followed by each department for providing the expected products and services to customers following established hotel policies and procedures (Hales, 2005). For example, managers in the front office will work with the Income Journal Clerk by reviewing the daily room revenue information. They can compare actual sales with forecasted, budgeted and last year's sales. They also work with the Accounts Payable Clerk by forwarding invoices for payment, checking on account numbers, researching invoice problems and ensuring that all invoices approved for payment are correct. Then they hand the day's work over to the Night Auditor who will check in any remaining guests and begin the process of auditing the day's work (Hall, 2008).

Managers in the restaurant and catering departments work with the accounting office in much the same manner as do the front office managers. However, instead of market segments, these managers are interested in meal period information (breakfast, lunch and dinner) to analyse their sales (Hales, 2005). Departments which do not produce any revenue, such as the sales and marketing, human resources and engineering departments will interact with the Accounts Payable Clerk only with regard to invoices for payment (Hales, 2005).

If a hotel uses a centralized computerized system to process the data, this is normally performed by one or more large computers housed at a central site that serve users throughout the organisation as illustrated in Figure 2.3. These IT activities are consolidated and managed as a shared organisational resource where end-users compete for these resources on the basis of need and the IT function is usually treated as a cost centre whose operating costs are charged back to the end-users (Hall, 2008).

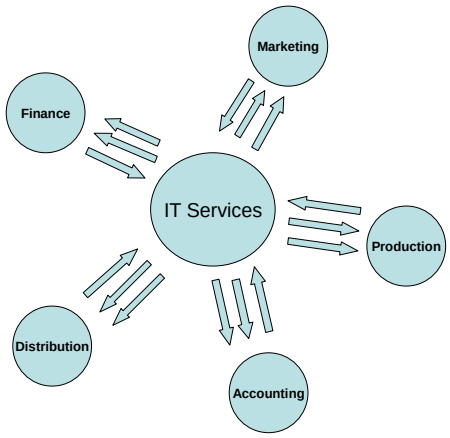


Figure 2.3: Centralized Data Processing Approach (Source: Hall, 2008)

2.2 The Theories Applicable to the Study

This study tests a theoretical extension of the Technology Acceptance Model (TAM) which is regarded as one of the most influential research models in explaining IT usage or acceptance behaviour in various contexts (Lee et al., 2006; Bruner and Kumar, 2005; Chen et al., 2002; Davis et al., 1989).To further understand the TAM, this section starts with explanations about the Theory of Reasoned Action (TRA) which is a major conceptual foundation for the TAM.

2.2.1 The Theory of Reasoned Action (TRA)

The TRA model was originally specified by Fishbein (1975) and then was analysed and refined by Fishbein and Ajzens (1975). The TRA is one of the most well-known and frequently applied attitude-behaviour models, which has proven successful in predicting and explaining behaviour across a wide variety of domains (Davis et al., 1989). According to Ajzen and Fishbein (1980, p.4), TRA is very general, 'designed to explain virtually any human behaviour'. Three components of traditional attitude concept of affective (behaviour), cognitive (beliefs) and conation (behavioural intentions) have been conceptually distinguished in the TRA.

The TRA assumes that behaviour is directly caused by behavioural intentions. 'Intention' used in the TRA is a focal factor that predicts an individual's intention to perform a given behaviour such as IT usage. The intention reflects how hard people are willing to try and how much effort they are planning to give to perform a behaviour. Therefore, the stronger the intention to perform behaviour, the more likely the behaviour will be enacted. TRA also identifies subjective norms (perceived general social norms) which indirectly affect behaviour through behavioural intentions. Attitude

is also identified as an independent variable which indirectly affects behaviour through its effect on behavioural intentions.

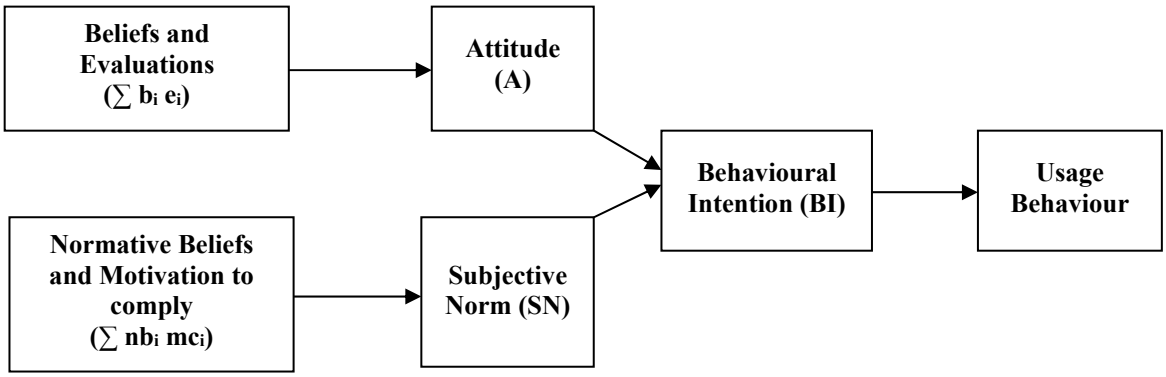


Figure 2.4: The Theory of Reasoned Action (TRA) Model

The TRA can be defined using three equations. Figure 2.4 describes the TRA model which can be summarized as follows:

$$BI = A + SN$$

Behavioural intention (BI) is determined by the person's attitude (A) and subjective norm (SN). BI refers to 'the strength of one's intention to perform a specified behaviour' (Fishbein and Ajzen, 1975, p. 288). A is a measure of 'an individual's positive or negative feelings (evaluation effect) about performing the target behaviour' (Davis et al., 1980, p. 984). SN is defined as 'the person's perception that most people who are important to him think he should or should not perform the behaviour in question' (Fishbein and Ajzen, 1975, p. 302).

$$A = \sum b_i e_i$$

The TRA assumes that a person's attitude (A) toward behaviour is determined by his or her salient beliefs (b_i) about consequences of performing the behaviour multiplied by the evaluation (e_i) of those consequences. Beliefs (b_i) refer to 'the individual's subjective probability that performing the target behaviour will result in consequence i' (Davis et al., 1980, p. 984). The evaluation (e_i) is defined as 'an implicit evaluation

response to the consequences' (Fishbein and Ajzen, 1975, p. 29). The equation represents an information-processing view of attitude formation. The attitude is indirectly affected by the external influences through changes in the person's belief structure (Ajzan and Fishbein, 1980, p. 82-86).

$$SN = \sum nb_i \, mc_i$$

Subjective norm (SN) in the TRA refers to an individual and is determined by a multiplicative function of his or her normative beliefs (nb_i), i.e., 'the influence (i.e., social pressure) of significant other referents' desire for the individual to perform or not perform behaviour' (Limayem et al., 2001, p. 275), and his or her motivation to comply (mc_i), with these expectations (Fishbein and Ajzen, 1975, p. 302).

2.2.2 The Technology Acceptance Model (TAM)

The original TAM (Figure 2.5) was developed by Davis (1986) with two major objectives. First, the TAM should improve understanding of the user acceptance processes, providing new theoretical insights into the successful design and implementation of IS. Second, the TAM should provide the theoretical basis for a practical 'user acceptance testing' methodology that would enable system designers and implementators to evaluate proposed new systems prior to their implementation.

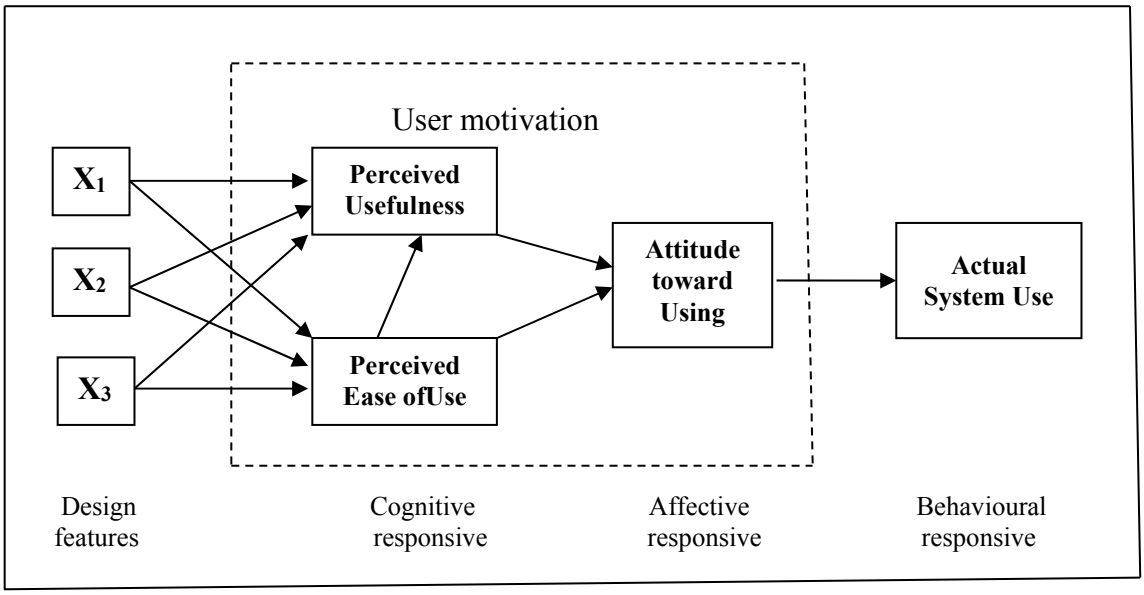


Figure 2.5: The original TAM by Davis (1986)

According to Davis (1986), it was hypothesized that a potential user's overall attitude towards using a given system is a major determinant of whether or not he actually uses it. The model further clarifies that the attitude toward using a system is a function of two major beliefs which are perceived usefulness and perceived ease of use. Design features which fall into the category of external variables (X_1, X_2, X_3 etc) directly influence perceived usefulness and perceived ease of use. However, they do not affect attitude or behaviour directly but only indirectly through perceived usefulness and perceived ease of use. The model also hypothesized perceived ease of use to have a direct effect on perceived usefulness. Definitions about each variable are shown in Table 2.1.

Table 2.1: Definitions of core constructs in the TAM

Core constructs	Definitions
Perceived usefulness	'the degree to which an individual believes that using a particular system would enhance his or her job performance' (Davis, 1986, p. 26).
Perceived ease of use	'the degree to which an individual believes that using a particular system would be free of physical and mental effort' (Davis, 1986, p. 26).
Attitude toward using	'an individual's positive or negative feelings (evaluative affect) about performing the target behaviour' (Fishbein and Ajzen, 1975, p.216).
Actual system use	'an individual's actual direct usage of the given system in the context of his or her job' (Davis, 1986, p. 25).

The TAM excluded subjective norms and behavioural intentions even though the two were the central elements of the TRA. Subjective norm in the TRA can be formed in two ways: (1) 'a given referent or some other individual may tell the person what the referent thinks he should do, and the person may or may not accept this information'; and (2) 'the person may observe some event or receive some information that allows him to make an inference about a given referent's expectation' (Fishbein and Ajzen, 1975, p. 304). Davis (1986) assumed that there were no relevant perceived social normative influences which would exist at the time that he empirically tested the original TAM model. The testing involved a control experiment where the system was described for respondents to evaluate immediately. Therefore, the respondents would not be able to receive information from referents to draw normative inferences. In a situation where no such influences exist, respondents may either correctly indicate that there is no normative belief, or the respondents attempt to guess what the views of their

referents would be. The latter would result in error and ambiguity in the measurement of subjective norm (Davis, 1986). It was also argued about how the respondents would guess what the expectations of their salient referents were regarding their use of the target system. With those problems it is unlikely that the normative belief would add to the explanatory power above and beyond attitude alone (Davis, 1986).

The behavioural intention variable was also omitted from the TAM. Intention reflects a decision that a person has made. It comes from the process of mental deliberation, conflict and commitment that requires some time period (Warshaw and Davis, 1985). It is an important decision by a new user of a system to decide whether or not to become a user. In the TAM, after demonstrating the system to the subjects, their motivation to use a new system would take place immediately after that; therefore, the time required to form an intention would not be expected (Davis, 1986).There could be situations where the subject cannot decide either way, which therefore would result in 'intention instability'. This situation exists when in an early stage; subjects have no intention but change to have one after the measurement of intention, before the performance of the target behaviour. Intention instability is recognized in the TRA as one of the factors that reduces the ability of measured intention to predict future behaviour (Fishbein and Ajzen, 1975, p.370).

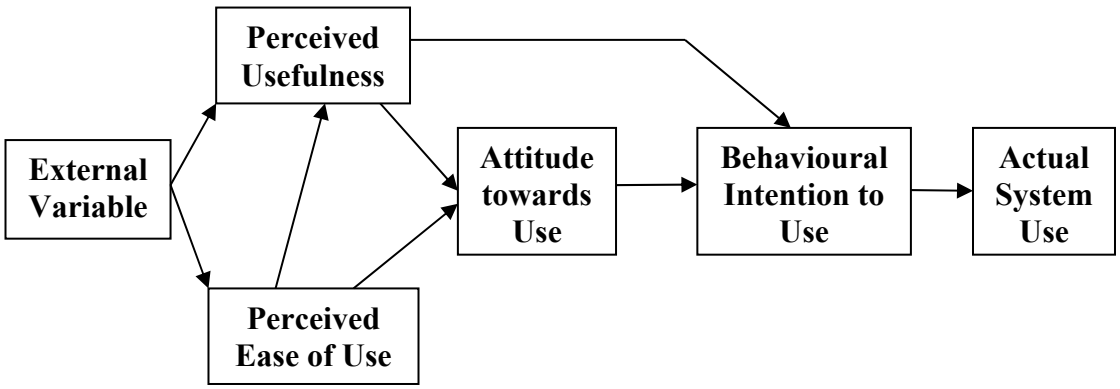


Figure 2.6: The Extended TAM by Davis et al. (1989)

However, later, Davis et al. (1989) improved the TAM by including the 'behavioural intention to use' in their model (Figure 2.6). The TAM thus became closer to the TRA, where actual computer usage is determined by behavioural intention. Davis et al. (1989) formulated the TAM in an attempt to understand why people accept or reject information systems (Szajna, 1996). The two primary predictors of TAM were still the perceived usefulness and perceived ease of use and the dependent variable of behavioural intention. The TRA assumed the behavioural intention to be closely related to actual behaviour. However, behavioural intention in the TAM is determined by the person's attitude toward using a system and its perceived usefulness. The TAM implies that, 'all else being equal, people form intentions to perform behaviours toward which they have positive affect' (Davis et al., 1989, p. 986). According to Davis et al. (1989, p. 986), the relationship between perceived usefulness and behavioural intention in the TAM is based on the idea that 'within organisational settings, people form intentions toward behaviours they believe will increase their job performance, over and above whatever positive or negative feelings may be evoked toward the behaviour per se'.

In their development of the TAM, Davis et al. (1989, p. 986) decided not to include subjective norm because it is difficult to 'disentangle direct effects of subjective norms on behavioural intentions from indirect effects via attitude'. They also argued that attitude may affect subjective norms, because in certain cases, people project their own attitudes onto others (Oliver and Bearden, 1985). The TAM is therefore less general compared to the TRA.

Referring to the TAM in the field of IT and IS, Bagozzi (2007) observed the very high number of citations of Davis et al. (1989). Those remarkable accomplishments, he

asserted, have led to the acknowledgement of TAM as a "status of a paradigm" (Bagozzi, 2007, p. 245). Paradigm can be define as one that serves as a pattern or model. King and He (2006) ran a meta-analysis study of the TAM applied in various fields. Their search of the papers shows that the number of studies that refer to the TAM rose substantially from an average of 4 per year in 1998 – 2001 to an average of 10 per year in 2002 – 2003. The search for papers in 2004 produced 140 studies with 23 studies found in the *Information & Management Journal*, 9 studies in each of the *International Journal of Human-Computer Studies* and *MIS Quarterly*. Other journals with high publications of the TAM were *Information Systems Research* and the *Journal of Computer Information Systems* with 8 studies respectively. From the total of 140 studies, 52 were eliminated because they were not empirical studies and did not involve a direct statistical test of the TAM, etc (King and He, 2006). This resulted in the remaining 88 studies involving more than 12,000 observations, and this provided powerful large-sample evidence on the TAM. The study concluded that the TAM measures of perceived usefulness, perceived ease of use and behavioural intention are highly reliable and that the measures may be used in a variety of contexts. The TAM correlations, according to the study, have considerable variability, and moderator variables were suggested to help explain the effects. In general, this meta-analysis study concluded that the TAM is a powerful and robust predictive model.

In a study in the hospitality sector, Kim et al. (2008) extended the TAM to investigate the relationship between antecedents of IS system quality and service quality; and users' acceptance of hotel front office systems (HFOSs). Their findings indicate that all relationships were significant except two variables of information quality to perceived ease of use and service quality to perceived usefulness. R^2 values for perceived

usefulness and ease of use were 0.38 and 0.33 respectively, indicating that antecedents in this study only explained 38% and 33% of the variances of the dependent variables respectively. The study concluded that the external variables of information system quality and perceived value can be used to enhance the model of the acceptance of HFOSs from the perspective of hotel frontline employees.

2.2.3 TAM2 and Subjective Norm

A further extension of TAM also known as TAM2 (Figure 2.7) was later developed by Venkatesh and Davis (2000). A major feature of their development was the role played by 'subjective norm'. They removed from the model 'attitude toward use' but included five external factors to influence perceived usefulness, which are subjective norm, image, job relevance, output quality and result demonstrability. In TAM2 they hypothesized that subjective norm influenced both perceived usefulness and intention to use, with experience and voluntariness operating as moderators of the effect of subjective norm on intention to use. Experience was also hypothesized to moderate the effect of subjective norm on perceived usefulness. They further hypothesized that subjective norm would have a positive effect on image and then image would have a positive effect on perceived usefulness.

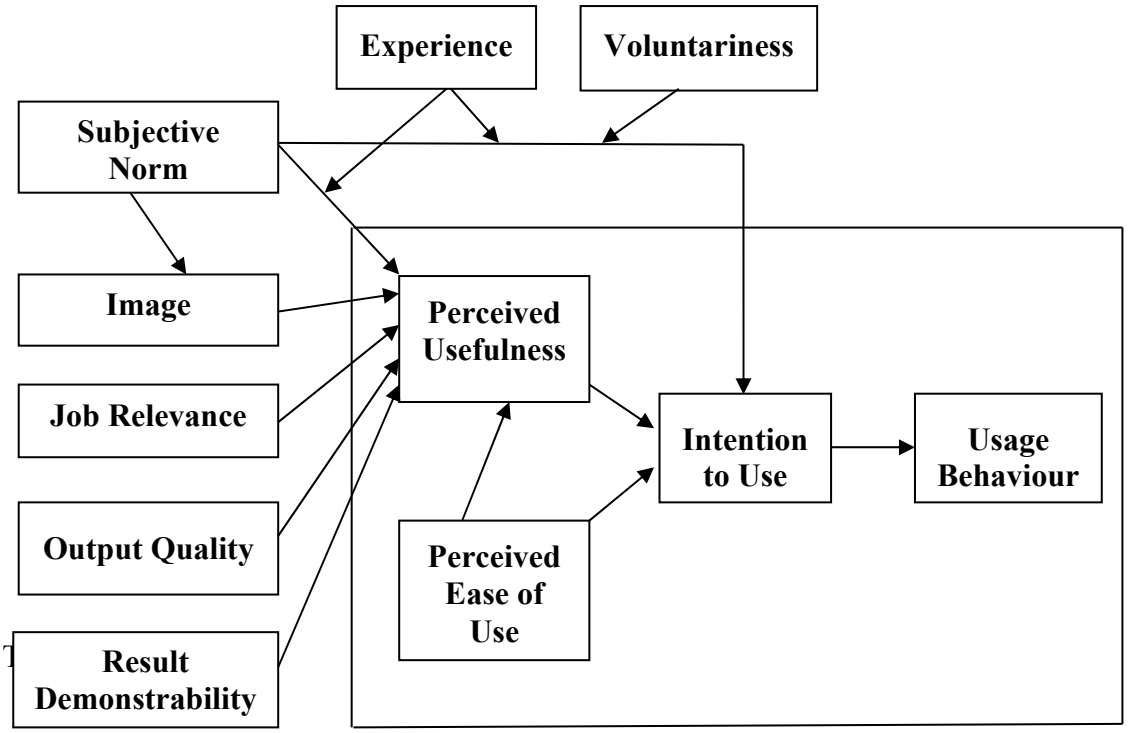


Figure 2.7: The TAM2 – Extension of the TAM by Venkatesh and Davis (2000)

Subjective norm, which was also included in the TRA, is defined as 'a person's perception that most people who are important to him think he should or should not perform the behaviour in question' (Fishbein and Ajzen, 1975, p. 302). In the TRA, subjective norm was hypothesized as a direct determinant of behavioural intention. TAM2 also assumed behavioural intention to be directly influenced by subjective norm and perceived usefulness. The model shows a direct effect of subjective norm on intention, because it is argued that even if the users do not prefer to use the system, if one or more important referents think they should, they will tend to use it. The referents could influence users and they will be sufficiently motivated to comply with the referents (Venkatesh and Davis, 2000).

In their original development of the TAM, Davis et al. (1989) empirically compared the TAM and TRA and revealed no significant effect of subjective norm on intentions over

and above perceived usefulness and perceived ease of use. Thus they omitted subjective norm from the TAM. However, they did acknowledge the need for further research to investigate the impact of social subjective norm on usage behaviour. Later, Mathieson (1991) compared the TAM and theory of planned behaviour (TPB). The TPB was also grounded in the TRA and was discussed by Ajzen (1985, 1991). TPB extended the TRA by incorporating an additional construct of perceived behavioural control. This new construct in the TPB was intended to deal with situations when an individual lacks substantial control over the targeted behaviour (Ajzen, 1991). According to TPB, attitude, subjective norm and perceived behavioural control can influence an individual's behavioural intention, which leads to individual's behaviour. The TPB was designed to predict behaviour across many settings and can be used to predict intention to use IS as well. The study by Mathieson (1991) found no significant effect between the relationship of subjective norm and intention to use a system.

A study by Hartwick and Barki (1994) found mixed findings regarding subjective norm. They separated respondents into mandatory and voluntary usage contexts, and their results indicated that there was a significant influence of subjective norm on intention to use in a mandatory situation context. However, the results showed that there was no significant direct effect of subjective norm on intentions when the usage was in voluntary usage. A year later, Taylor and Todd (1995) found a significant effect of subjective norm on intentions.

Venkatesh and Davis (2000) empirically tested the TAM2 model which showed that subjective norm significantly influenced usefulness. They also found that experience with the system tended to reduce dependence of users on social information in forming

perceived usefulness and intentions. Users relied upon and judged a system's usefulness based on the benefits resulting from usage (Venkatesh and Davis, 2000). The results of the research into the impact of subjective norm on predicted dependent variables such as usefulness, by Venkatesh and Davis (2000) was in line with previous studies (e.g.: Riemenschneider et al., 2003; Cheung et al., 2002; Igbaria et al., 1997). However, some other studies did not find significant results (e.g.: Lau et al., 2001; Roberts and Henderson, 2000).

2.3 Satisfaction with IS

In the present high-tech environment, the investment in IT or IS within an organisation cannot be ignored. However, to assess the return on investment or the effectiveness or success of IS remains a critical issue in IS management. IS can be viewed in many ways; therefore a number of system success measures exist, such as cost-benefit analysis, system usage and the most widely used measure, end-user IS satisfaction. 'Satisfaction is defined as an emotional response or affect toward an object' (Locke, 1976) and that definition has been used widely by IS researchers. Bailey and Pearson (1983) defined satisfaction as 'the sum of feelings or attitudes, both positive and negative, toward the spectrum of factors affecting a specific situation'. Cyert and March (1963) were the first to introduce the concept of user satisfaction as a surrogate for system success. They emphasised that the ability of IS to satisfy needs as a determinant of the success of a system.

The absence of objective determinants of IS effectiveness therefore requires a substitute measure of user satisfaction. Users themselves constantly evaluate how they perceive IS because if the system cannot fulfil their needs, they will turn to another source. Users

will stop using a system which fails to satisfy them (Evans, 1976). Previous studies show that user satisfaction is potentially measurable, and generally acceptable. Galletta and Lederer (1989) notes that these IS success measures fall into two general outcome categories, as shown in Figure 2.8.

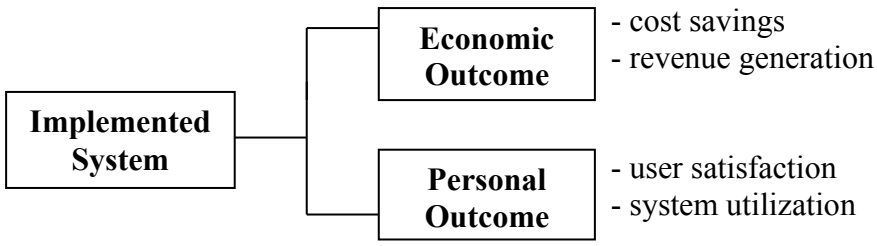


Figure 2.8: A Model of Information Systems Outcomes

The management information system (MIS) literature shows that the personal outcome is the most often used because user satisfaction and system utilization are easier to measure. Cerullo (1980) revealed that MIS professionals considered user attitudes to be the single most important success factor.

According to DeLone and Mclean (1992), user satisfaction is widely used as a measure of IS success because of a number of reasons; (1) a high degree of face validity, 'if the users like a system, means the system is success'; (2) availability of reliable instruments to measure user satisfaction which allow comparison of results among studies; and (3) other available measures (e.g.: system quality, information quality and individual impact) are poor, that is, conceptually weak or empirically difficult to obtain. Raymond (1987) agreed that user satisfaction was the best measure of system success. According to Ives et al. (1983) a "good" IS that is perceived by its users as a "poor" system is indeed a poor system. Therefore, it can be concluded that users who are satisfied with a systems will perform better than those who are not satisfied with it. Gatian (1994) also revealed the same when he found that there is a strong relationship between satisfied users and better decision-making performance and efficiency among users. A study by

Shaw et al. (2003) pointed out that satisfied and dissatisfied end-users have 'different technological frames of reference' towards end-user computing which affect their expectations of the technology, their interactions with the information centre support staff and their utilization of the technology.

It is more than three decades since MIS researchers became preoccupied with the issues surrounding the evaluation of IS success (Achewe, 1976; Swanson, 1974). Lack of objective measures of IS success has made researchers rely on users' perceptions as a measure of the success of IS. Bailey and Pearson (1983) identified a list of 39 factors as an instrument to measure computer user satisfaction. Ives et al. (1983) then re-evaluated and refined the instrument and further development occurred later by Baroudi and Orlikowski (1987). The instrument finally ended up with a list of only 13 items, which can be broadly grouped into three main dimensions of information output; which are (1) EDP staff; (2) services; and (3) involvement. Later, Doll and Torkzadeh (1988) developed a 12-item instrument which contains content, accuracy, format, ease of use and timeliness. The instrument by Doll and Torkzadeh(1988) was a synthesis of the Ives et al. (1983) measure of user information satisfaction which is a widely used, well-validated and generalized instrument (e.g.: Doll et al., 1995; Doll and Torkzadeh, 1988).

Among the instruments to assess the success of IS, a model developed by DeLone and McLean (1992) has received wide attention from researchers (eg., Rai et al., 2002; Seddon, 1997; Goodhue and Thompson, 1995; Seddon and Kiew, 1994). DeLone and McLean (1992) reviewed 180 studies of IS success measures and they identified over 100 IS measures from those studies. They then synthesized six IS success variable categories from the diversity contained in the previously reported studies. The

categories of the taxonomy are information quality, system quality, actual use, user satisfaction; individual impact and organisational impact (see Figure 2.9). There was no empirical evidence provided for the model and, in fact, further development and empirical validation were suggested by DeLone and McLean for their taxonomy (DeLone and McLean, 1992).

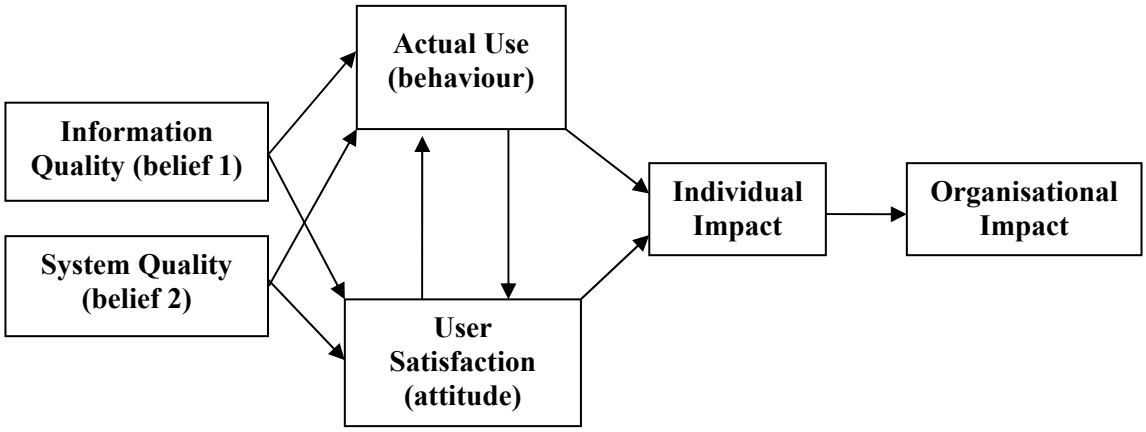


Figure 2.9: The Original IS Success Model (DeLone and McLean, 1992)

In 2003, DeLone and McLean proposed an updated version of the IS success model (Figure 2.10). This version was proposed due to the criticisms of the earlier version received from other studies (Figure 2.9). The management IS community did not accept the earlier version as it seemed to ignore the emergence of new economic activities (Chen and Cheng, 2009) in the light of the dramatic changes in IS practice, especially the advent and explosive growth of e-commerce (Wang, 2008).

The primary changes to the 2003 version were the addition of the "service quality" construct. The "use" construct in the 1992 version was therefore divided into "intention to use" and "actual use". Finally, the "individual impacts" and "organisational impacts" constructs were combined into a single factor called "net benefits". This new version still needs further validation however, before it can serve as a basis for the selection of

appropriate IS measures (Wu and Wang, 2006). Molla and Licker (2001) claimed that the IS success model should be extended further to account for particular relationships between e-commerce and environments in various organisational contexts.

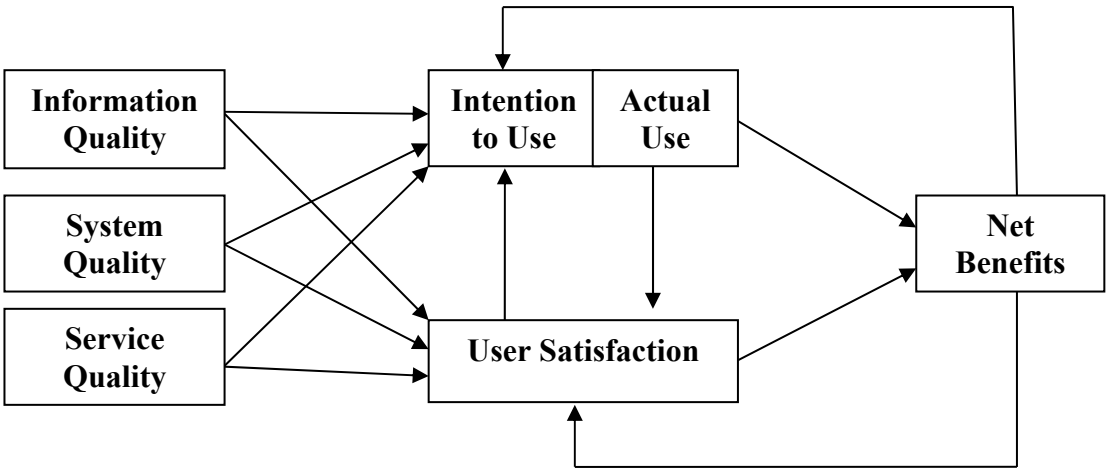


Figure 2.10: The Modified IS Success Model (DeLone and McLean, 2003)

End-user Satisfaction

Melone (1990) defined end-user satisfaction as an attitude that can be theoretically justified, as in Fishbein and Ajzen's TRA (Fishbein and Ajzen, 1975). The TRA suggests that an individual's behaviour can be predicted from the individual's attitude towards (1) the behavioural action, and (2) the social norms that influence the probability of performing the behaviour. Melone (1990), therefore, suggested that an individual's perceptions of IS can be used to predict the success of the system. He continued that end-user satisfaction is an affective attitude towards all activities related to an end user's interaction with IS.

Davis and Olson (1985) defined end-user computing by distinguishing between primary and secondary user roles where the former makes decisions based on the system's output and the latter is responsible to directly interact with the application software (enter information to the system and prepare final output reports) but does not use the

output directly in his/her job. In end-user satisfaction, both of the roles are combined when the person who utilizes the system output also develops it (Doll and Torkzadeh, 1988). They further explained that user information satisfaction, especially the information product, focuses on the primary role and is independent of the source of the information (i.e. the application). Secondary user satisfaction varies by application; it depends on an application's ease of use. Despite the growing hands-on use of inquiry and decision support applications by managerial, professional and operating personnel, research on user information satisfaction instruments has emphasized the primary user role, measuring overall user information satisfaction (Doll and Torkzadeh, 1988). Rainer and Harrison (1993) concluded that, based on the definition of end-user satisfaction in relation to the end-user computing construct, end-user satisfaction is an individual's attitude towards the use of computers.

This current study focuses on the satisfaction of end-users who are directly using the AIS and also utilizing the output from the AIS. Thus, this study is measuring overall user satisfaction in terms of the AIS in users' daily routines.

2.4 Organisational Impact

How and to what extent IT usage leads to improved performance remains open to question. Clarifying the relationships between IT investment and its impact remains an important area of inquiry in IS research. The relationship between the IT applications within firms' and its impact is an on-going research topic. According to previous studies, those relationships are complex and multifaceted. However, research in this area has shown that IT may indeed contribute to competitive advantage and hence the improvement of performance (Deveraj and Kohli, 2003; Hitt and Brynjolfsson, 1996).

The term ‘IT business value’ is normally used when referring to performance impacts of IT. The organisational impact measures used are productivity enhancement, profitability improvement, cost reduction, competitive advantage and inventory reduction (Deveraj and Kohli, 2003; Hitt and Brynjolfsson, 1996; Kriebel and Kauffman, 1988). According to Euske et al. (1993), the measures of organisational impact may differ in importance and meaning to different organisations. Thus, each measure requires understanding with regard to its particular organisational setting and it requires in-depth fieldwork (Ahrens and Chapman, 1998).

It is believed that ignoring IT or under-utilizing IT could impact companies negatively as it would create strategic vulnerability and competitive disadvantage (Garces et al., 2004). However, Dehning et al. (2004) argued that there is little empirical evidence that IT investment expenditures actually lead to an improvement in business processes. According to Gamble (1990) in certain situations, IT did not impact an organisation’s operation; in fact sometimes, the costs associated with it, such as capital, training and additional staffing borne by the organisation exceed the benefits generated. Bharadwaj (2000) suggested that the inconsistent statistical findings with regard to the impact of investment in IT and performance are due to incomplete understanding of the nature of a firm’s IT resources and skills and the timescale involved. He also argued that the amount of investment as a surrogate for assessing a firm’s IT intensiveness is a poor indicator. His study indicated that IT capability is a resource that is not easily imitated or substituted. The analysis not only suggested that IT resources take time to acquire and build, but also highlighted the difficulties raised by complementary resources and resource-embeddedness. Thus, the firm’s IT, logistics and distribution systems, combined with a strong customer orientation, create a set of complementary resources

that are not easily matched by rival firms. They therefore add to long-term competitiveness but are normally difficult to compute.

Somewhat predictably, Ismail and King (2005) concluded that companies with a high degree of alignment between AIS requirement and AIS capacity will perform better than those companies with an AIS processing capacity insufficient to match their requirements. Some studies reported a significant positive relationship between IT investment and company productivity and performance (Rai et al., 1997; Mahmood and Mann, 1993; Alpar and Kim, 1990). However, other studies rejected this conclusion (Barua et al., 1995; Weill, 1992). Melville et al. (2004) concluded their study with the principal finding that IT is valuable but the extent and dimensions of 'IT business value' depends on a variety of factors, including type of IT, management practices, organisational structure, as well as the competitive and macro environment. Their study is consistent with the findings of previous studies by Brynjolfsson et al. (2002), Cooper et al. (2000), and Dewan and Kraemer (2000).

IT can be fruitful, if certain prerequisites are satisfied, namely the existence of long-term IT planning and strategy, some innovative business process re-engineering, top management commitment, and training throughout the hierarchy. It will be inappropriate if companies use IT as a stand-alone initiative because IT can only support the success of organisations provided that rational and innovative planning and management is exercised constantly and consistently (Robson, 1994; Freedman, 1991; Ward et al., 1990). IT can potentially have a dramatic impact on the travel and hospitality industry, because it forces the sector to rethink the way in which it organizes

its business, its values or norms of behaviour and the way in which it educates its workforce (Vlitos-Rowe, 1992).

The impacts of IS on organisations are of considerable importance to IS practitioners; however, MIS academic researchers have tended to avoid performance measures (except in laboratory studies) because of the difficulty of isolating the effect of the IS effort from other effects which influence organisational impact.

This current study will relate the usage of and satisfaction with the AIS to the organisational impact because many studies have found a significant positive relationships between IT usage and organisational productivity and performance (e.g.: Byrd and Turner, 2001; Rai et al., 1997). The study will look at the impact of usage of and satisfaction with the AIS with reference to hotel performance based on the perceptions of those who use the system.

2.5 The Proposed Conceptual Model

King and He (2006) argued that the TAM has come to be one of the most widely used models in IS, partly because of its understandability and simplicity. However, not all TAM relationships are supported in all empirical studies. There is wide variation in the predicted effects in various studies with different types of users and systems (Legris et al., 2003). Davis et al. (1989) proposed that external variables can directly affect the beliefs of perceived usefulness and perceived ease of use. Therefore, in a TAM, external variables such as organisational variables (e.g.: top management support and training), system features (e.g.: design and functionality) and personal features (e.g.: experience, computer efficacy, innovativeness) can affect attitude and behaviour through perceived

usefulness and perceived ease of use. There is much research that verifies the external variables of a TAM (e.g.: Rouibah et al., 2009; Burton-Jones and Hubona, 2006; Shang et al., 2005; Amoako-Gyampah and Salam, 2004; Hu et al., 2003; Hong et al., 2002; Venkatesh and Davis, 2000).

Previous studies have stated that there are positive effects and benefits from IT; however, IT may not be fully accepted if external barrier factors influence its acceptance (Davis et al., 1992; Davis, 1989). This current study will develop the model using previously tested variables within the context of the TAM. To predict AIS acceptance and satisfaction in the hotel industry in Malaysia, external factors such as top management support, information system sophistication, involvement in system design and implementation, training, past experience, internal expertise and external expertise were chosen as antecedent factors to affect perceived usefulness and perceived ease of use, based on previous studies in the IT and IS fields.

It should be noted that much of the literature review is composed of research findings related to IT, particularly IS. Most research has been undertaken on the more general topic of IS, rather than AIS. However, the extension of this work into AIS is one of the contributions claimed for the study.

Figure 2.11 is a proposed conceptual model for this current study, which has been developed from the discussion above and is extended from the TAM (Davis et al., 1989).

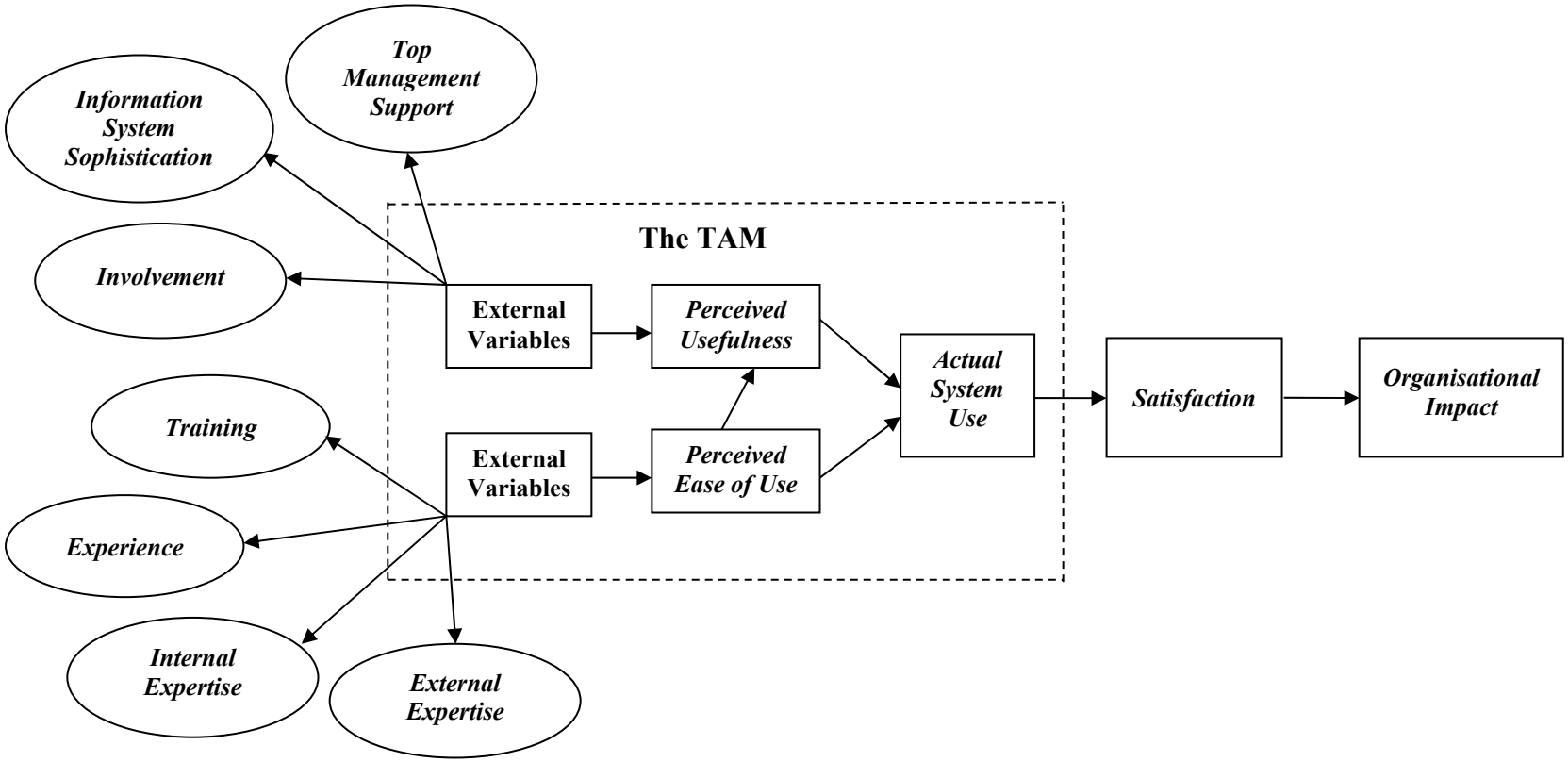


Figure 2.11: The Proposed Conceptual Model for the Current Study

This current study will not include subjective norm[1] in the analysis because accounting staff in the accounts department in a hotel have to use the AIS whether they like it or not, or whether they believe in it or not. Therefore, whatever is said or thought by their referents or colleagues will not influence the acceptance of the AIS to enhance their usage and satisfaction. The selection of AIS in a hotel by accounting staff is determined by their superiors; thus feelings and beliefs prior to usage of the AIS are not considered. A previous study (Venkatesh and Davis, 2000) claimed that users with experience in any system relied less on social information. Therefore, if a user has a certain experience with a system, whatever is said or expected from his or her referents will not affect the perceived usefulness or usage of the system. Over time, users of a system would experience and value the system based on their own usage and not on what is perceived or expected by their referents.

Moreover, this research is applied to the acceptance of the system already in operation and not a new one; therefore it is assumed that subjective norm cannot be considered in this situation. Subjective norm is more suitable if a research study is about a new or proposed system or a new user of a system, whereas, for users who have used a system for some time, the subjective norm is not so relevant. Davis et al. (1989) decided not to include subjective norm in their TAM because of its uncertain theoretical and psychometric status and because, as agreed by Fishbein and Ajzen (1975, p.304), 'subjective norm is one of the least understood aspects of the TRA'. A quantitative meta-analysis study by Schepers and Wetzels (2006) was conducted to investigate subjective norm within the TAM.

[1]Subjective norms have particular reference to the initial adoption of IS. It is significantly less suited to evaluation of established system.

Altogether, a total of 51 usable articles were found to undertake this sort of analysis. The results of the analysis indicated that the relationships between subjective norm and perceived ease of use, attitude toward use and usage were not significant. Therefore, its omission from this study is justified.

Attitude and behavioural intention are also excluded from the model of the current study. Both the TRA and TAM models assumed that attitude and behavioural intention are under volitional control. Attitude is measured by 'an individual's positive or negative feelings (evaluation effect) about performing the target behaviour' (Davis et al., 1980, p. 984). According to TRA and TAM, the person can decided at will, either to perform or not to perform the behaviour. This current study will omit both variables of attitude and behavioural intention because in a hotel, accounting staff must use the system in operation to produce the required accounting data, regardless of their personal desires, and thus cannot respond to their attitude and behavioural intention with respect to the definitions provided by the TRA and the TAM. This study is more concerned about the antecedent factors that affect perceived usefulness and perceived ease of use of the AIS in a mandatory situation and how those two major beliefs could directly impact the actual use of the AIS.

The final goal of the TAM is the actual system use, whereas, in this current study, satisfaction after using the system is another important variable and its organisational impact is the ultimate end result. The actual use of the system by an individual is not the only objective of using a technology. Bagozzi (2007) argued that the TAM and TRA terminal goal of behaviour (which is the 'usage behaviour' for the TRA and the 'actual system use' for the TAM) fails to consider that the use of the system is not focused on the immediate aim of the users but rather is a means to more fundamental ends or goals.

Lucas (1978) and Welke and Konsynski (1980) also claimed that the actual use of a system as a measure of IS success is only applicable for voluntary users only. When users choose to use the system for their own benefits, decisions to use the system can be considered as IS success in this context. However, in a mandatory situation, where users cannot decide which system they favour, usage behaviour cannot be a determinant of IS success. Therefore, this study addresses broader objectives of using a system by looking at the satisfaction with the system, i.e. whether the system in use satisfies users' needs to support them in their work activities. Another important objective is the organisational impact of using the systems, which is also included in this current study as the final goal to be achieved.

2.6 Hypothesis Development

Drawing on the above general discussion, Figure 2.12 (developed from Figure 2.11) shows the model of the study which is divided into three main sections. The output or *organisational impact* becomes the ultimate goal of the study. The four constructs of *perceived usefulness (PU)*, *perceived ease of use (PEOU)*, *usage* and *satisfaction* are referred to as the internal dynamics which draw on the central focus of the TAM. The antecedent factors are the inputs or the external factors in the model which comprise seven variables.

Satisfaction with the AIS is hypothesized to be a major determinant of its *organisational impact*. The study also hypothesizes that the *usage* of the AIS, *perceived usefulness (PU)* and *perceived ease of use (PEOU)* are determinants of *satisfaction*. The *usage* of the AIS indirectly influences *organisational impact* through *satisfaction*. The *usage*, in turn, is a function of two major beliefs of *perceived usefulness* and *perceived ease of use*. At the same time, *perceived ease of use* is hypothesised to have a causal

effect on *perceived usefulness*. Finally, three inputs or external factors are hypothesized to directly influence *perceived usefulness* and another four external factors directly impact *perceived ease of use*. All of these items/variables will be discussed further in the sections which follow.

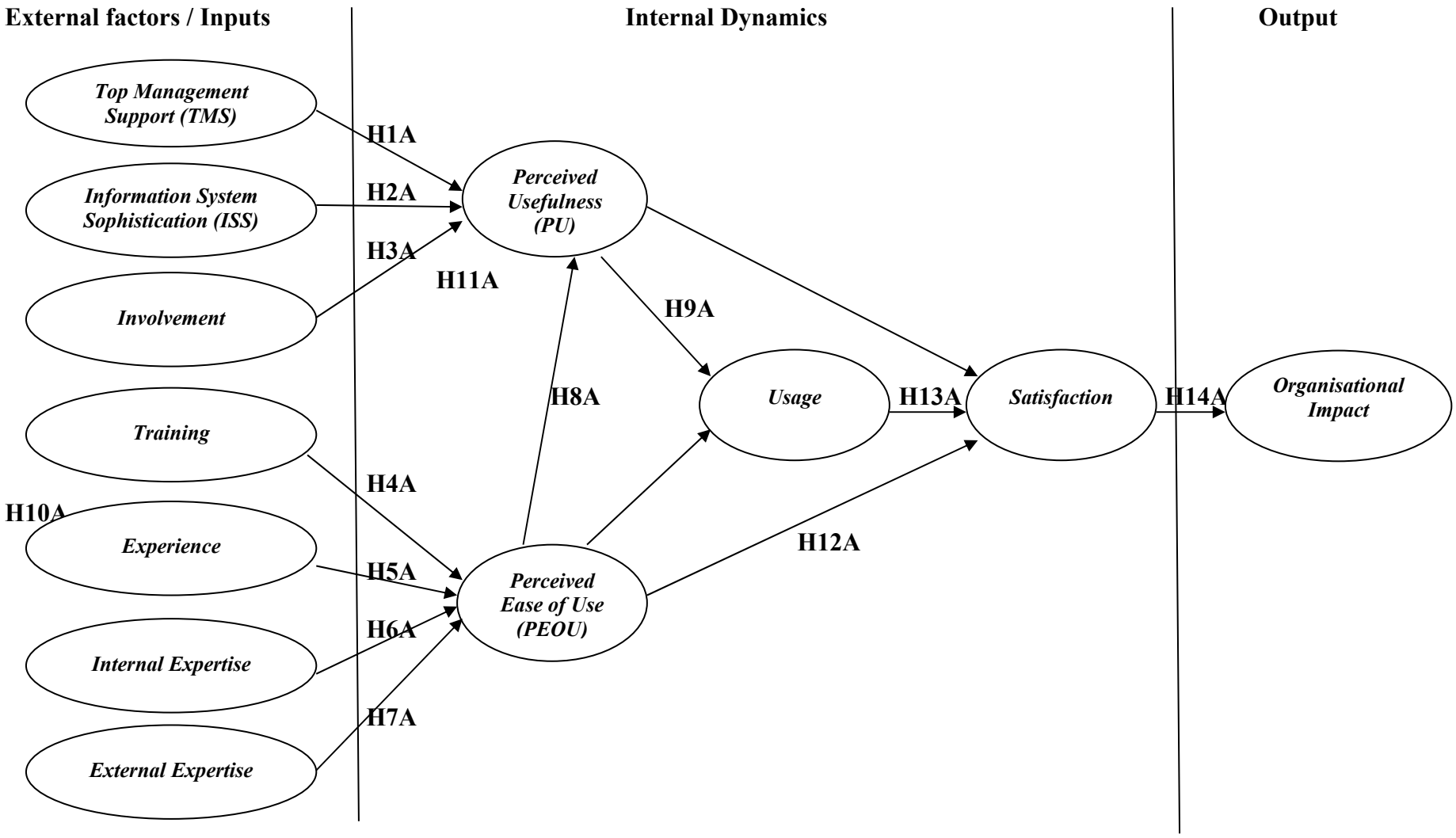


Figure 2.12: The Hypotheses for the Current Study

2.6.1 External Factors

Top Management Support (TMS)

The acceptance and usage of a new system in an organisation could be influenced by formal or informal support of activities or functions by the top management of the organisation. Top management is referred to senior management in the hotel. They are the members who make decisions on the hotel operations. In the case of this study, top management is depends on the status of ownership of the hotels, whether the hotels are dependent or independent. The managers in an organisation could provide direction, authority and resources during and after the acquisition of any IT system. Among the various forms of support that can be provided by the organisation are the necessary infrastructure, hiring expertise in the system and off-the-job training. Davis et al. (1989) proposed that *PU* and *PEOU* were affected by organisational support. Lederer and Mendelow (1988) stressed that a key requirement for successful implementation of any system is *TMS* because the support can provide a long-term strategic vision, initiative, support and a commitment to create a positive environment for innovation (Quinn, 1985; McGinnis and Ackelsberg, 1983).

Support from the top management is regarded as the most important driver for any successful change in the organisation (Dale, 1999; Balsmeier and Voisin, 1996; Hamel and Prahalad, 1989). Top management need to provide direction and involvement in the process, apart from support for all the entities in the organisation. There is a need to ensure that all staff are satisfied with the changes to a system (Nandhakumar et al., 2005; Davenport, 1998) because top management's concern and involvement in management information system development will lead to greater success (Doll, 1985; Rochart and Crescenzi, 1984). Institutional factors such as user training and organisational support have been shown to have a highly significant influence on

individual technology use (e.g.: Monge et al., 1992; Raymond, 1988) and a positive effect on IS performance through diverse activities (Delone, 1988; Cerullo, 1980).

According to Igbaria (1990), in general, *TMS* promotes the quality of the specific system and allocation of necessary resources. A significant relationship between facilitating conditions and personal computer utilization was found by Al-Khaldi and Wallace (1999). Anandarajan et al. (2002) also found a significant relationship between organisational support and system usage; and the lack of *TMS* was a critical barrier to IS use (Guimareas and Igbaria, 1997; Igbaria et al., 1995). Lewis et al. (2003) examined the influence of institutional factors of top management commitment on usefulness and ease of use of new technology. Their findings suggested that both belief of usefulness and ease of use with technology usage can be influenced by top management commitment. Dong et al. (2009) divided *TMS* into three different types and they found that different support behaviours exercised different influences on implementation of IS. They suggested that top managers needed to adjust their support actions to achieve the desired outcomes.

A study by Lee and Kim (2007) was based on innovation-implementation and technology innovation theories applied to internet-based information systems. They found that the organisational factor of *TMS* affects the implementation success of internet-based information systems categorized by three dimensions of volume, sophistication and information contents. *TMS* is therefore, a key factor for both individual and organisational implementation processes. Analysis by Diez and McIntosh (2009) indicated that the *TMS* factor is fundamental to the successful implementation of IS. Al-Gahtani (2004) confirmed the important role of computer support in influencing computer acceptance. Ifinedo (2008) looked at *TMS* on ERP

system success and found that the higher the support for the ERP initiative, the greater is the ERP success. Rouibah et al. (2009) revealed that among the three external variables in their study, *TMS* was found to have the strongest effect on IS/IT usage and user's satisfaction, followed by the availability of training and user involvement. Additionally, other studies have found that organisational support influences usage (Al-Gahtani, 2004; Anandarajan et al., 2002; Straub et al., 2001; Karahanna et al., 1999). Following the above discussion, this current study predicts that:

H1: *Top Management Support (TMS)* is positively associated with *Perceived Usefulness (PU)* of the AIS

Information Systems Sophistication (ISS)

In recent years, IT infrastructure has been identified as another capability that can influence a firm's ability to use IT strategically (e.g.: Sambamurthy et al., 2003; Armstrong and Sambamurthy, 1999; Broadbent et al., 1999; Ross et al., 1996). IT infrastructure is defined as a shared set of capital resources that provide the foundation on which specific IT applications are built (Broadbent and Weill, 1997; Duncan, 1995). The primary constituents of IT infrastructure are (1) computing platform (hardware and operating systems), (2) communications network, (3) critical shared data, and (4) core data processing applications (Byrd and Turner, 2000). The differential flexibility of firms' IT infrastructure makes the cost, pace, and value of IT-enabled innovation different for different firms (Broadbent and Weill, 1997; Duncan, 1995).

The contingency-based perspective asserts that IT resources per se may add little value and may only play a major role in improving a firm's performance when they are planned and used to support a firm's main strategic objectives (Oh and Pinsonneault, 2007). The size of investments in IT does not increase efficiency if the usage of the

system is limited because firm performance is influenced more by the usage of actual applications than by the amount of IT investment (Weill, 1992).

Ismail and King (2007) explored the alignment between AIS requirements and AIS capacity and the factors that influence the alignment. The results of their study showed support for the association between informational sophistication and AIS alignment but not between technological sophistication and AIS alignment. The evidence suggests that informational sophistication (the number and types) of the applications adopted is more important than technological sophistication (the number and diversity) of technologies used for small and medium enterprises to achieve AIS alignment.

The most comprehensive measure of IT/IS sophistication was developed by Raymond and Pare (1992). This included all aspects related to technological, informational, functional and managerial sophistication. They defined IT sophistication as a construct which refers to the nature, complexity and interdependence of IT usage and management in an organisation. In this current study, IS sophistication applies to complex, modern and integrated systems within an organisation where data bases are shared among all the departments within the organisation. On one hand this may make the systems easier to use, or on the other make them complex and unwieldy. One objective of this research is to explore the impact of IS sophistication on perceived usefulness. The aspects of IT/IS sophistication introduced by Raymond and Pare (1992) will be used to measure IS sophistication in this study.

According to Raymond and Pare (1992), Technological sophistication refers to the diversity of IT used while informational sophistication is reflected by the nature of its application portfolio. Functional sophistication was characterized by the structural

aspects of the information systems function and the implementation process and managerial sophistication relates to the mechanisms employed to plan, control and evaluate present and future applications. *ISS* has been generally used as an important determinant of IS success (e.g. McGowan and Madey, 1998; Raymond, 1987; Lehman, 1986).

Byrd et al. (1995) defined IT infrastructure as the shared information service delivery base within an organisation that is built around IT and a specific body of knowledge such as skills and experience. Using multiple case studies, they focused on the influence of IT infrastructure on the nature of the IT planning process in large public organisations. They used IT innovativeness and IT sophistication to operationalise the IT infrastructure and found that large agencies with mature IT infrastructures were better able to develop higher quality IT plans.

The capability of IS infrastructure is one of the most important issues considered by IS executives (Brancheau et al., 1996). To successfully implement a new technology, a basic level of IS infrastructure is necessary (Cash et al., 1992). The extent of efforts to introduce an IT innovation depends on the existing practices and the hardware and software currently in use (Chau and Tam, 1997). In an empirical study by Grover (1993), IS infrastructure was found to be one of the top predictors of IS success among several other factors investigated. Wixom and Watson (2001) also found that the technology used for development is associated with technical implementation success.

Lee and Kim (2007) found that firms with a sophisticated IS infrastructure or expertise were able to access the required technological resources (e.g. hardware, software and competent analysts etc.) to implement internet-based IS effectively. Firms with

sophisticated IS infrastructure and IS expertise could afford the capital, people and technology required for the implementation of their system. When a highly computerized IS infrastructure exists, internet-based IS may be effectively integrated with internal systems to produce greater benefits (Lee and Kim, 2007). In a study by Zu et al. (2003) it was found that physical IT infrastructure contributed to e-business adoption in European firms. A recent study by Hussein et al. (2007) supported the notion that IS facilities which refer to the availability of IS/IT resources and IS/IT infrastructure are positively associated with IS success in the electronic-government context. Based on discussions of previous studies, this current research predicts that:

H2 *Information System Sophistication (ISS)* is positively associated with *Perceived Usefulness* (*PU)* of the AIS

Involvement

User *involvement* has been defined as 'participation in the system development process by potential users or their representatives' (Barki and Hartwick, 1989, p.53) and it is a traditionally held assumption that user *involvement* in the development process is a major factor in systems' success. Many studies have focused on demonstrating a correlation between user *involvement* and IS success. However, Ives and Olson (1984) reviewed the IS literature and found results from these studies to be mixed. Baroudi et al. (1986) and Newman and Noble (1990) suggested that these mixed results may be due to a limited operational definition of user *involvement*. Much of the existing literature on user *involvement* (e.g.: Alam, 2002) claimed that 'user *involvement*' is a broader concept where users are involved in the product development process. However, both the terms user participation and user *involvement* have been used interchangeably in the literature (Palanisamy, 2001; Barki and Hartwick,1989).

The development of a usable system is a goal for any system design (Karat, 1997; Gould and Lewis, 1985). In order to achieve the goal to have a usable system, early and continual focus on users is important. It is generally agreed that usability is achieved through the *involvement* of potential users in system design (Bekker and Long, 2000; Wilson et al., 1997; Karat, 1997). Wood (1997) claimed that through automation part of the users' knowledge has become tacit and therefore this creates difficulties in involving users and understanding users requirements. According to Kujala (2003) involving users in product design is not an easy task and thus, the type and level of user *involvement* need to be carefully considered.

Rondeau et al. (2006) in their study indicated that high levels of organisational involvement in IS related activities resulted in higher levels of IS management effectiveness. An earlier study by Franz and Robey (1986) investigated a sample of 118 user managers in 34 companies and found that user *involvement* in design and implementation is related positively to users' perceptions of system usefulness. The findings of user participation in IS risk management was also in line with other types of IS systems where user participation contributed to improved security control performance through greater awareness, greater alignment between IS security risk management and the business environment (Spears and Barki, 2010). Hartwick and Barki (1994) suggested that communication activity to be considered as one of the dimensions of user participation. They refer to communication activity as 'the performance of information exchange activities as users communicate formally or informally with other participants (e.g.: other users, IS staff, senior management) during the IS development' (Hartwick and Barki, 1994, p. 22).

Baroudi et al. (1986) surveyed 200 production managers and found that user *involvement* in the development of information systems enhanced statistically significantly system usage and user's satisfaction. Later, Winston and Benjamin (2000) also found positive effects of user participation and user *involvement* upon user attitudes. Kujala (2003) reviewed the benefits and challenges of user *involvement* and from the analysis of the literature suggested that user *involvement* has a generally positive effect, especially on user satisfaction. The study also revealed that developers get more accurate user requirements by involving users. A study by Rouibah et al. (2009) indicated that user *involvement* has a direct effect on *PU* and *PEOU*. In line with previous studies about the positive effects of user *involvement* on the IS development success, this current study hypothesises that:

H3: *Involvement* is positively associated with *Perceived Usefulness* (*PU)* of the AIS

Training

An early study by Brady (1967) suggested that lack of management information system utilization was due to lack of education. Nelson (1991) claimed that both education and *training* are part of an individual's total learning experience. Yaverbaum and Nosek (1992) conducted a study about the effects of IS education and *training* on user satisfaction and concluded that education and *training* will lead to changes in user satisfaction. The importance of both types of learning (education and training) has been well-documented in the IS literature (e.g.: Davis and Yi, 2004; Venkatesh and Speier, 1999; Davis and Bostrom, 1993; Cheney, 1988; Argyris, 1982). IS usage is believed to be influenced by general intellectual abilities and knowledge of specific content areas (Zmud, 1979).

Torkzadeh and Dwyer (1994) reported that the availability of *training* programs in the organisation is of crucial importance to IT implementation success. It was also agreed by Compeau et al.(1995) as they claimed that end-user *training* is a critical intervention in order to ensure successful implementation of IS innovations. A recent study by Sharma and Yetton (2007) suggested *training* as one of the most important post-implementation interventions that leads to greater user acceptance and system success. Venkatesh and Bala (2008) considered *training* as a post-implementation intervention because normally *training* is conducted after a system is deployed and ready to be used by potential users. They also argued that *training* is an important intervention as different modes of *training* can be used to manipulate different determinants of IT adoption. However, despite large investments made to provide end-user *training*, the theoretical conceptualizations of the effect of *training* on implementation success needs attention (Jasperson et al., 2005). The appropriate *training* method also needs to be highlighted to secure the most efficient and effective results. Davis and Davis (1990) found that the use of a lecture approach with a skilled trainer is the better *training* method compared to the self-study method.

A study by Simon (2000) indicated a correlation between learning style, *training* technique, user satisfaction and computer use. It was found that trainees whose learning style matched *training* methodology were more successful in *training* outcomes and had higher computing satisfaction. An earlier study by Abdul-Gader (1990) also found a significant relationship between *training* and computer user satisfaction. Venkatesh (1999) concluded that game-based *training* was more effective than traditional *training* to enhance user acceptance of a new system and the effect of ease of use on behavioural intention to use the system was stronger with game-based *training*. Mood during the

training was also found to play an important role in forming individuals' perceptions of new IT (Venkatest and Speier, 1999).

Gallivan et al. (2005) revealed that the amount of user *training* that employees received and the employee's beliefs about the quality of *training* received did not relate to their level of IT usage. This result was in contrast with the results generated earlier by Al-Gahtani (2004) where it was found that in the context of computer acceptance, organisational support and *training* were found to have strong positive relationships with computer usage and satisfaction. This finding substantiates the importance of having systematic *training* programmes and support procedures and resources to ensure a higher degree of computer usage and satisfaction in the organisation. Several well-designed and customized support levels and *training* programmes should acquaint end-users regarding the direction in which the organisation is heading and would pay off in terms of a higher rate of computer usage and satisfaction (Al-Gahtani, 2004). In an earlier study by Nelson and Cheney (1987) it was observed that there was a positive relationship between computer-related *training* and computer-related ability. They also found a positive relationship between the computer-related ability and the acceptance of information systems products and technologies of end users.

Hartono et al. (2007) studied the factors that contributed to management support systems and found that user *training* is the most important factor to contribute to the *satisfaction* of the system, followed by management support. However, the study also revealed that user *training* was ranked the lowest as an organisational impact success measure. A recent study by Larsen (2009) concluded that user *training* plays a role in explaining the users' perceptions of the relevance of the enterprise resource planning

(ERP) project's business objectives for the organisation and for their own jobs. Thus, this current study hypothesises that:

H4: *Training is* positively associated with *Perceived Ease of Use* (*PEOU)* of the AIS

Experience

Users with computer *experience* are suggested to be more at ease when participating in IS activities. Even though user *experience* is already recognized by researchers as one of the influential factors in IS acceptance, it is rarely found to be adopted in empirical studies in academic journals (Hassenzahl and Tractinsky, 2006). The level of skill or *experience* of the individual has long been recognised as an important factor for the acceptance of computer technology, apart from the technology itself (Nelson, 1990). The level of an end user's computer literacy directly affects satisfaction with information systems (e.g. Nelson and Cheney, 1987; Lee, 1986; Bruwer, 1984; Benson, 1983). Igbaria et al. (1995) extended the TAM to investigate the impact of external factors on the user acceptance of microcomputer technology. Their study proposed computer *experience* to directly and indirectly affect usage through beliefs of usefulness and ease of use. Computer *experience* was found to have a significant direct effect on *PEOU*. The study also revealed that computer *experience* has an indirect effect on *PU* through *PEOU*. In a study conducted by Cheney and Dickson (1982), systems professionals indicated that they perceived their organisation's electronic data processing *experience* to be a significant determinant of success in a management information systems project.

DeLone (1981) found that firms with greater electronic data processing *experience* tended to be less dependent on external programming services and to incur proportionally fewer expenses for hardware. Thompson et al. (1994) reported that

experience directly influenced personal computer utilization which had implications for both researchers and practitioners. A meta-analysis study by Mahmood et al. (2000) showed that end-user information satisfaction is strongly affected by user background and other variables such as user *experience*, user skills and user involvement. Liaw and Huang (2003) in their study about user attitudes towards search engines found that *experience* of using operating systems is positively seen to influence *PEOU* of search engines. This study was supported by a study by Agarwal and Prasad (1999) when they found that the extent of prior *experience* with similar technologies is positively associated with ease of use about IT. Thong et al. (2002) extended the TAM by focusing on individual differences and found that computer *experience* has a positive effect on *PEOU* of the digital library. However, all these studies were in contrast with a recent study by Kuo and Ye (2010). They included work experience in personal factors to investigate users' perception of IT within the organisation. The results showed that work experience was not a statistically significant impact on IT acceptance.

Venkatest et al. (2008) hypothesized that *experience* would strengthen the relationship between behavioural intention and system usage. Their hypothesis was supported when *experience* was found to significantly influence usage. Earlier, Venkatesh et al. (2003) also reported that facilitating conditions with increasing *experience* have a stronger effect on system usage. Facilitating conditions are 'the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system' (Venkatesh et al., 2003, p. 453). Following these discussions on the positive effect of *experience* in the majority of previous studies, this current study hypothesises that:

H5: *Experience* is positively associated with *Perceived Ease of Use* (*PEOU)* of the AIS

Internal Expertise

Lack of accounting and IS staff with appropriate expertise can have serious implications for awareness and understanding of the importance of accounting systems and IT. These knowledge deficiencies may inhibit the adoption of more contemporary accounting information and sophisticated technology and this is likely to reduce its value to management. IS are complex systems requiring both technical and organisational expertise in terms of design, development, and management. Therefore one of the most important factors to be considered in the adoption of new technologies is the expertise of the people who are using the systems. In fact, this was found to be positively related to the adoption of IS (Kwon and Zmud, 1987; Raymond, 1985). Without IT expertise, organisations may be unaware of new technologies, and may not be prepared to invest to adopt these technologies because of uncertainties and risks.

Previous studies stressed the important role played by IT expertise for performance handling technical systems (e.g.: Davis, 1994; Ye and Salvendy, 1994; Shanteau, 1992). Chi et al., (1988) supported this, pointing out the potential for experts handling complex problems on technical systems. According to Clemons (1986) IS can deliver a sustainable competitive advantage from managerial experience and expertise. IS expertise has the potential to create business strategies by focusing on internal and external IS applications (Clemons, 1986).

Sumner (2000) found that insufficient *internal expertise* is one of the risk factors in an enterprise wide information management systems project and his study revealed that most firms made investments in training and support required to overcome technical and procedural challenges in design and implementation. However, apart from having *internal expertise,* it is important also to optimize the use of consultants.

Ziefle (2002) looked at the influence of user *expertise* of different mobile phones. Even though mobile phones are very different from AIS, user *expertise* was demonstrated to play a highly important role in the usability of mobile phones. Experts were more successful in solving the tasks and acting significantly faster (Ziefle, 2002). Ismail (2004) found that AIS alignment in the small and medium manufacturing firms in Malaysia was positively related to the *internal expertise*. Yap et al., (1992) empirically studied the factors that contributed to the success of the computer based information systems adopted in small businesses and found *expertise* to be one of the important factors.

Small and medium size businesses have problems with a lack of experienced accounting and IS staff (Reid and Smith, 2000; Reid et al., 1999; Gable and Raman, 1992). These problems resulted in a lower level of awareness of new technologies and understanding about the importance of IT. Gable (1991) also claimed that small and medium sized businesses often have trouble to recruit and retain internal IT/IS expertise because of lack of resources and limited career advancement. Therefore, those businesses normally rely on basic financial accounting information such as balance sheet and profit and loss statements to make business decisions instead of the wider information set which could be provided by a developed IS (Holmes and Nichols, 1988; Mairead, 1997). Premkumar and Roberts (1999) studied the adoption of new technologies in rural small businesses and found IT *expertise* as one of the factors that influenced the adoption of the technologies in modern society.

This study includes *internal expertise* as an important factor to influence *PEOU*. When the users have knowledge and skills about IT or IS and at the same time an accounting

background, they will be more at ease to deal with accounting packages. This current study hypothesises that:

H6: *Internal expertise* is positively associated with *Perceived ease of Use* (*PEOU)* of the AIS

External Expertise

External expertise refers to the outside parties such as vendors or dealers, consultants, accounting and audit firms and government agencies with specific reference to their IT/IS knowledge and the extent to which they can give advice and provide training, maintenance, technical support etc to the adopting organisations. *External expertise* is found to be an important factor of IS effectiveness (e.g.: Thong et al., 1996, 1994; Yap et al., 1992; Gable, 1991).

Many studies investigated the impact of *external expertise* on enterprise resource planning (ERP) systems (e.g.: Wang and Chen, 2006; Sedera et al., 2003). A study by Ifinedo (2008) found that there was a very strong relationship between the *external expertise* and ERP success. The study also stressed that quality of *external expertise* is critical for the success of ERP. The study is in line with the results from previous studies that ERP system benefits and impacts tend to be rated highly when quality of *external expertise* of vendors and consultants are engaged (Ko et al., 2005; Gefen, 2004; Geren and Ridings, 2002). However, findings are not unanimous; a previous study by Bajwa et al. (1998) about executive information system success found no direct links between vendors' and consultants' support and the success of the system. Ismail (2004) also indicated that there is no significant relationship between AIS alignment and the use of external factors. The insignificant results about the use of *external expertise* to support IS success were in line with previous studies reported by Soh et al. (1992) and Lees (1987).

The factor of *external expertise* in the implementation of IS was found to be particularly important in the small and medium size enterprises compared to other form of business. This may be due to their lack of computer experience and insufficient internal computer expertise in these small and medium size businesses. Therefore, they were more dependent than larger businesses on outside expertise such as vendors and consultants. Small businesses lag in the use of IT because of constraints in financial resources, not enough support from trained personnel and a short-range management perspective (Thong et al., 1994; Welsh and White, 1981). In order for small businesses to use IT to enhance competitiveness and improve performance (Dwyer, 1990; Lincoln and Warberg, 1987; Clark, 1987) they need the support of *external expertise* to reduce IT investment uncertainties. A study by Thong et al. (1994) found TMS an important factor for IS effectiveness in small businesses; however, high quality of external IS expertise is even more critical. Gable (1991, 1989) and Kole (1983) stressed the importance of computer consultants to assist small business to implement IS. Empirical evidence about the positive impacts of the level of consultant effectiveness on the IS effectiveness was also recorded (Soh et al., 1992; Yap et al., 1992). Another important source of expertise for small business is vendors or dealers. Previous studies have highlighted the importance of vendors to small businesses (Farhoomand and Hrycyk, 1985; Garris and Burch, 1983) because there was empirical evidence that good vendor support significantly affected IS effectiveness (Yap et at., 1992; Lees, 1987).

For the purpose of investigating the usage of and satisfaction with AIS, this current study included vendors/dealers, consultants, accounting/audit firms and government agencies as all representative of *external expertise*. IT vendors/dealers could be an important source of expertise to organisations because they are the parties who provide computer hardware and software to organisations. They also provide technical support

and training to users. IT consultants play important roles in helping organisations by providing useful information related to IT/IS. Thong et al. (1994) explained that IT consultants should advise their customers in terms of information requirements, analysis of business needs, recommending suitable computer hardware and software, and guide organisations regarding managing implementation of the IS.

In terms of accounting and audit firms, Elliot (1992) claimed that these firms know better about their client's financial positions and business prospects; and thus can use their knowledge to advise the clients about the use of information and IT to enhance performance. Finally, according to Ein-Dor et al. (1997), government agencies could play roles in terms of providing support and incentives to organisations who invest in IT, for example by offering subsidies and low interest loans. The government agencies could also provide seminars and technical expertise. Thus, this current research hypothesises that:

H7: *External expertise* is positively associated with *Perceived Ease of Use (PEOU)* of AIS

2.6.2 Internal Dynamics

The discussions of internal dynamics build particularly on the earlier work of the TRA (see section 2.2.1) and the TAM (see section 2.2.2 and 2.2.3). This current study extended the TAM by including one construct of *satisfaction* with the model placing this within the internal dynamics. The two important beliefs of the TAM, *perceived usefulness* and *perceived ease of use* are retained in this study. The *usage* construct in this study is the equivalent of the actual system use in the TAM.

Perceived Usefulness (PU)

Perceived usefulness is defined as 'the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organisational context' (Davis, 1986, p. 26). According to Davis (1986), the TAM posits that two particular beliefs of *PU* and *perceived ease of use* are of primary relevance for computer acceptance behaviours (*usage*). If IS users believe that using the system will increase their performance and productivity, they will have positive attitudes towards the IS (Igbaria et al., 1996; Mawhinney and Lederer, 1990). Davis et al. (1989) compared the two models of TRA and TAM in order to predict peoples' computer acceptance from a measure of their intentions. The study found that *PU* is a major determinant of people's intention to use computers. Davis (1989) developed and validated new scales for *PU* and *perceived ease of use*; his empirical study found that *PU* was significantly correlated with both self-reported current *usage* and self-predicted future *usage* of the IT. The study also revealed that *usefulness* had a greater correlation with *usage* behaviour than did *ease of use*.

Strong support was found in the relationships between *PU* and attitude or behavioural intentions which led to IS use across various contexts. Studies by Taylor and Todd (1995) and Igbaria et al. (1995) reported a strong effect of *usefulness* on attitude and system *usage*. A further study by Igbaria et al. (1997) supported those results when it focused on personal computing acceptance factors in small firms in New Zealand. The findings indicated that *PU* has a strong effect on system *usage*. Gefen and Keil (1998) studied the impact of developer responsiveness by extending the TAM. Their study supported the idea of Davis (1986) by indicating in a positive significant relationship between *PU* and self-reported use of IS. Hong et al. (2002) also found a significant impact of *usefulness* on behavioural intention to use digital library technology.

Gefen and Straub (2000) investigated the adoption of e-commerce and concluded that *usefulness* affects intended use when a website is used for both inquiry and purchasing tasks. *Usefulness* was found to be the most significant factor for physicians' acceptance of telemedicine technology (Chau and Hu, 2001). *Usefulness* was also reported to have a strong effect on behavioural intention to use web-based information systems (Yi and Hwang, 2003). Selim (2003) revealed that *PU* has a direct significant effect on *usage* of a course website. Wang et al. (2003) extended the TAM to study the determinants of user acceptance of internet banking and reported a significant direct relationship between *usefulness* and intention to use the technology. Saade and Bahli (2005) studied the impact of *PU* in online learning and concluded with strong support for the link between *usefulness* and intention to use online learning. In a meta-analysis study, King and He (2006) concluded that the TAM measure of *PU* is highly reliable and may be used in a variety of contexts.

A study by El-Gayar and Moran (2007) reported that *usefulness* is a significant determinant of attitude and intention for students' acceptance of tablet personal computers. Ha and Stoel (2009) found that *PU* predicted both the attitude and behavioural intention on consumer e-shopping. Al-Gahtani and King (1999) and Rouibah et al. (2009) also found positive relationships between *PU* and IS *usage*. Contrary to previous studies, two exceptions have been identified; Tzou and Lu (2009) reported a non-significant relationship between *PU* and intention to use fashion technology. In an earlier study about individual and technological factors of web-based learning technologies in a developing country, Brown (2002) found *PU* did not predict *usage*.

There are a number of studies on *PU* and user's *satisfaction* and the results across studies were consistent. Adamson and Shine (2003) extended the TAM to measure end-user information systems *satisfaction* in a mandatory environment of a bank's treasury. Their results suggested that if the end-users perceive a newly implemented system as *useful*, then they are likely to show *satisfaction* with the system. In a meta-analysis study of variables affecting information technology end-user *satisfaction*, Mahmood et al. (2000) used the empirical results of 45 end-user *satisfaction* studies published between 1986 and 1998 by focusing on nine variables including *PU*. The results were found to be statistically significant. Chiu et al. (2009) studied customers' loyalty towards online shopping and found *usefulness* has significant effects on customers' *satisfaction* and loyalty intentions. Roca et al. (2006) extended the TAM to investigate e-learning continuance intention. They found strong support for the relationship between *PU* and *satisfaction* with the e-learning service.

A positive relationship between *PU* and user's *satisfaction* were also found in the recent studies by Rouibah et al. (2009); Rouibah (2008); Petter (2008) and Liu et al. (2006). These were consistent with previous studies (e.g. Bhili et al., 1998; Igbaria et al., 1996; Yoon and Guimaraes, 1995; Thompson et al.,1994). Individuals are likely to have positive attitudes about IS if they believe that using the system will increase their performance and productivity. It seems that users will tolerate the difficulties of using a system because of the functions it performs for them.

The above discussions about the *PU* show that *usefulness* has a positive effect on attitude and behaviour intentions which lead to the *usage* of IT or IS. Previous studies also reported that *usefulness* can predict *satisfaction* with the IT or IS. Thus this current study hypothesises that:

H9: *Perceived Usefulness* **(***PU)* is positively associated with *usage* of the AIS

H11: *Perceived Usefulness* (*PU)* is positively associated with *satisfaction* with the AIS

Perceived Ease of Use (PEOU)

Perceived ease of use refers to 'the degree to which a prospective user expects the target system to be free of effort' (Davis, 1986, p.26). *PEOU* is found to be a significant secondary determinant of people's intentions to use computers after *PU* (Davis et al., 1989). Davis (1989) also claimed that *PEOU* was a causal antecedent to *PU*.

Igbaria et al. (1995) revealed that *ease of use* strongly correlated with *PU*. Gefen and Keil (1998) also found that *PEOU* directly affected *PU* in the case of developer responsiveness to use of IS. Those two earlier studies were supported by more recent studies (e.g.: El-Gayar and Moran, 2007; Saade and Bahli, 2005: Wang et al., 2003; Selim, 2003; Brown, 2002; Hong et al., 2002; Gefen and Straub, 2000). Later studies by Tzou and Lu (2009), Chiu et al. (2009) and Ha and Stoel (2009) also supported the previous results when they found the impact of *ease of use* on *usefulness* was significant. However, Chau and Hu (2001) found no significant effect of *ease of use* on *usefulness*. A later study by Yi and Hwang (2003) also reported that *ease of use* had no significant effect on *usefulness* in terms of using the web-based information systems, but these are exceptions.

Previous studies also produced mixed results about the relationships between *PEOU* and *use* of IS. In the Davis et al. (1989) study which compared the two models of TAM and TRA, they revealed that *PEOU* had a small but significant effect on intention to use computer technology. An empirical study by Davis (1989) to validate newly developed

scales for *usefulness* and *ease of use* found that *ease of use* was significantly correlated with current and predicted future *usage*. Gefen and Straub (2000) looked at the importance of *PEOU* of e-commerce adoption and found *ease of use* affects intended use when a website is used for an inquiry task. Hong et al. (2002) reported a positive significant influence of *ease of use* on behaviour intention to use. A study about the acceptance of web-based learning technologies in a developing country showed that *PEOU* is the main predictor of *usage* (Brown, 2002). *PEOU* as a determinant of user acceptance of internet banking also revealed a significant result on intention to use the technology (Wang et al., 2003).

In a study about the use of online learning, Saade and Bahli (2005) found a direct but weak support for *ease of use* on intention to use. A similar study by Yi and Hwang (2003) supported the same direct but weak result for *ease of use* on intention to use web-based information systems. King and He (2006) in their meta-analysis study reported that the *PEOU* measure is highly reliable and can be used in various contexts. El-Gayar and Moran (2007) found that *ease of use* is a determinant of attitude but not of intention to use a tablet personal computer. Rouibah and Hamdy (2009) studied the factors affecting instant-messaging *usage* and user *satisfaction* in Kuwait and the results showed that *PEOU* directly influenced *usage*; however, it indirectly affected users' *satisfaction* via *usage*. However, a study by Tzou and Lu (2009) found a significant direct negative effect of *ease of use* on intention to use fashion technology.

Gefen and Keil (1998) found that *ease of use* did not significantly impact the use of IS. A study by Chau and Hu (2001) also reported no significant effect of *ease of use* on attitude. An earlier study by Taylor and Todd (1995) found a non-significant relationship between *ease of use* on attitude. Igbaria et al. (1995) also reported a

significant direct effect of *ease of use* on *usage* of individual computer technology. In a study about the acceptance by students of a course website, Selim (2003) found no significant relationship between ease of use and *usage*. A recent study about consumer e-shopping acceptance found a significant effect of *ease of use* on attitude to use the system (Ha and Stoel, 2009).

The study of *PEOU* on users' *satisfaction* conducted by Adamson and Shine (2003) showed relatively strong, positive and a statistically significant relationship which is in line with a study by Mahmood and Burn (2000). Rouibah et al. (2009) indicated that *PEOU* has a direct influence on users' *satisfaction* and thus supported the results of previous studies (Davis, 1989; Davis et al., 1989; Igbaria et al., 1995). Liu et al. (2006) reported that end-user information *satisfaction* is strongly affected by perceived benefit and expectations characteristics such as *PU*, *PEOU* and user expectations. They concluded although *ease of use* is important, the *usefulness* of the IS is even more important. This leads to the following hypotheses:

H8: *Perceived Ease of Use* (*PEOU)* is positively associated with *Perceived Usefulness* (*PU)*

H10: *Perceived Ease of Use* (*PEOU)* is positively associated with *usage* of the AIS

H12: *Perceived Ease of Use* (*PEOU)* is positively associated with *satisfaction* with the AIS

Usage

There is a need to distinguish between 'use or *usage*' and 'intention to use' because both terms occur frequently in the literature of IT/IS. According to Delone and McLean (2003) 'intention to use' is an attitude, whereas, '*usage*' is a behaviour. *Usage* in this current study refers to the users' reported actual use of AIS. Another term which is also

common in the literature is ‘attitude toward use’. The term can be found in the TRA and the TAM. Fishbein and Ajzen (1975, p.216) defined ‘attitude toward use’ as ‘an individual’s positive or negative feelings (evaluative affect) about performing the target behaviour’.

DeLone and McLean (1992) developed a model of IS success by focusing on the *use* of and *satisfaction* with the system. They revised the model in 2003 by including intention to use as another important construct to the original model. Delone and McLean (1992) argued there is a `reciprocal’ relationship between *use* of a system and *satisfaction* with the system, that is, at the same time they can affect each other. However, Torkzadeh and Dwyer (1994) called for further studies to explain the causality direction between the two constructs because the issue was open to debate.

Livari (2005) empirically tested the original DeLone and McLean (1992) model and found that *usage* was a significant predictor of *satisfaction*. However, *usage* was insignificant in terms of its influencing individual impact. There are three models suggested by Baroudi et al. (1986) for the relationship between *usage* and *satisfaction*. (1) the dominant or ‘traditional model’: *usage* and *satisfaction* are not related (supported by e.g.: Al-Gahtani and King, 1999); (2) *usage* influences *satisfaction* (supported by e.g.: Lee et al., 2009), and (3)*satisfaction* influences *usage* (supported by e.g.: Rouibah and Hamdy, 2009). This current research will study the second link of *usage* influences *satisfaction* based on evidence from previous literatures (e.g.: D’Ambra and Rice, 2001; Gelderman, 1998; Guimares and Igbaria, 1997). This study will also investigate the third link, which of *satisfaction* influences *usage,* to provide robustness tests on the results of the proposed model.

A recent study by Dai et al. (2011) revealed that attitude toward using a digital platform based on the internet, developed by the Taiwan government, can predict the *satisfaction* from using it. This result is supported a previous study by Wang and Liao (2008) when they focused on success of an e-government system in Taiwan. They also found that the use of the e-government system can be a determinant of the user's satisfaction with the system. Al-Gahtani (2004) also found that greater computer *usage* is positively associated with users' satisfaction, which supported the previous studies by Khalil and Elkordy (1999) and Igbaria and Nachman (1990).

In a study about the organisational factors and human motivations affecting IT/IS in an Arab country, Rouibah et al. (2009) found a significant positive relationship between *usage* and *satisfaction*. Baroudi et al. (1986) conducted an empirical study related to the impact of user involvement on system *usage*, which showed that *usage* influenced *satisfaction* with the system. A study by Goodhue and Thompson (1995) was mainly concerned about the link between IS and individual performance. They developed a new model with an empirical analysis of data from over 600 individuals in two companies. Their study found a significant relationship between system utilization and individual performance. A similar study by Igbaria and Tan (1997) examined the consequences of IT acceptance on individual performance and revealed that the use of a system or computer acceptance has a significant effect on individual performance. Other studies about the link between *usage* of IS and individual performance also disclosed a significant relationship between those two constructs (e.g.; Torkzadeh and Doll, 1999; Weill and Vitale, 1999; Yuthas and Young, 1998; Teng and Calhoun, 1996).

Contradictory to the above discussions, a study by Alshare et al. (2011) on the impact of system and human factors on online learning systems *use* and learner *satisfaction* with a

sample of 674 college students, found no significant direct relationship between the *use* of the systems and user *satisfaction*.

Following the above discussion about the strong significant influence of *usage* as a determinant of a few dependent variables, this current research hypothesized that:

H13: *Usage* of AIS is positively associated with *satisfaction* with the AIS

Satisfaction

Satisfaction with the IS as a surrogate measure to IS success has been widely used in the literature (e.g.: Shaw et al., 2003; Gatian, 1994; Doll and Torkzadeh, 1988; Davis and Olson, 1985; Bailey and Pearson, 1983). Most previous studies dealing with IS success treated *satisfaction* as the dependent variable or the final goal in their model. In this current study, *satisfaction* with the AIS is a determinant of *organisational impact*. Not many studies determine *organisational impact* because of the fact that it is empirically difficult to measure (DeLone and McLean, 1992). The revised IS model by DeLone and McLean (2003) has 'net benefits' as their dependent variable, which captured the balance of positive and negative impacts of system use. According to them, the 'net benefits' will be from a variety of 'net benefits' measures.

Tarafdar et al. (2010) studied the concept of techno stress and revealed that *satisfaction* with the content, accuracy and timeliness of the information provided by ICT would significantly influence user performance with the ICT and, thus, reduce stress caused by an inability to cope with the demands of organisational computer *usage*. Another study by Dimitrios et al. (2010) focused on *satisfaction* with online shopping. Their study disclosed significant positive relationships between customer *satisfaction* with a web store and customer revisit frequency, customer repurchase frequency, customer revisit

intentions and customer repurchase intentions. A more recent study by Bontis et al. (2011) investigated the role of information sharing, job characteristics and employee *satisfaction* to improve service delivery. The findings of the study suggested that employees' *satisfaction* was related to greater reported efficiency and customer focus. The results also suggested that HR departments should cooperate with IT departments to promote high-quality service delivery because it is IT departments that typically spearhead knowledge management initiatives.

Wand and Liao (2008) surveyed 119 users of government-to-citizen (G2C) e-government systems and found a significant positive relationship between user *satisfaction* and perceived net benefit in the G2C e-government context. McGill and Hobbs (2003) studied user-developed applications using the DeLone and McLean model (2002) and reported that user *satisfaction* was significantly related to perceived individual impact and intended use of the systems. Carlson and O'Cass (2008) explored e-service quality and revealed that customer *satisfaction* with web sites influenced both attitude towards the web sites and behavioural intentions to use the web sites. In an investigation about customers' loyalty intentions towards online shopping, Chiu et al. (2009) reported that *satisfaction* with online shopping has strongly influenced such loyalty.

A few studies related *satisfaction* with a system to the continuous use of the system or extended use of the system. A study by Cheung and Lee (2011) on user *satisfaction* with an e-learning portal divided *satisfaction* into information *satisfaction* and system *satisfaction*, which are determinants of overall *satisfaction* with the system. They found that overall *satisfaction* with the system had a significantly strong impact on intention to continue to use the system. Another study by Lin (2011) on perceived fit and

satisfaction with online learning performance also revealed that *satisfaction* with the system is strongly related to a continued intention to use it. Hsieh and Wang (2007) in their study found that *satisfaction* has a direct impact on extended use of complex IS. However, interestingly, the results changed when they analysed the data by including *usefulness* and *ease of use;* this resulted in no significant direct impact of *satisfaction* on extended use of complex IS. Roca and Gagne, (2008) also found a significant positive result between *satisfaction* and e-learning continuance intention.

Based on the discussions above about the impact of *satisfaction* with a system on various dependent measures, this current study is interested to investigate the influence of *satisfaction* with the AIS and its organisational impact, i.e, the hotel industry in a Malaysian context. This current study thus, hypothesizes that:

H14: *Satisfaction* with the AIS is positively associated with *organisational impact*

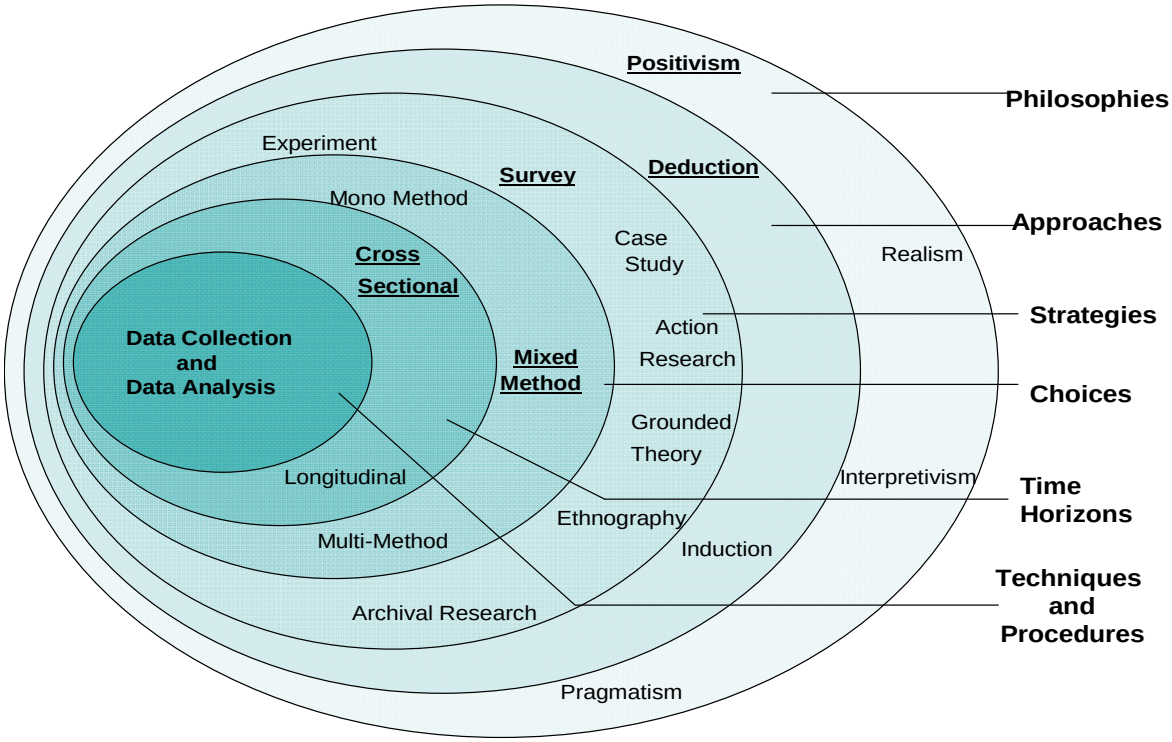
2.7 Summary of the Chapter

The chapter first explained the established IS and IT acceptance models of TAM and TRA. It then developed a model which is grounded in the TAM and TRA. All the variables used in this study are based on previously supported studies in the context of IT and IS. This chapter drew attention to the previous studies and theories applicable to support this current research. Hypotheses were then developed to be tested in this current research with regard to the usage of and satisfaction with AIS in the hotel industry in Malaysia.

CHAPTER THREE
Research Methodology

3.0 Introduction

The aim of any research methodology is to answer the research questions and achieve the research objectives of the study. According to Collis and Hussey (2003, p. 55), research methodology refers to 'the overall approach to the research process, from the theoretical underpinning to the collection and analysis of the data'. This chapter begins by introducing the methodological research paradigms of positivism/objectivism and interpretivism. It continues with possible research strategies and then the research approach used in this study is explained. After considering both quantitative and qualitative data, different research choices combining data collection techniques and analysis procedures are outlined. This chapter is structured by referring to the research process 'onion' proposed by Saunders et al. (2009) shown in Figure 3.1.



Source: Saunders et. al., 2009

Figure 3.1: The Research Process 'Onion'

3.1 Research Philosophy

The term research philosophy or research paradigm concerns beliefs about how research should be conducted. Guba and Lincoln (2005) point out that a research paradigm is a basic set of beliefs that guide action from four aspects: ontology, epistemology, axiology and methodology. Ontology refers to the researcher's assumptions about the social world, or in other words, the nature of reality applied to a phenomenon. Those assumptions held by the researcher will then influence him/her on how to acquire knowledge about the phenomenon, or what is to be regarded as acceptable knowledge based on a particular discipline (epistemology). The term axiology, in research philosophy, is about the study of the nature, types, and criteria of values and of value judgments such as those of ethics, aesthetics or religion. What is considered the best or preferred means of acquiring knowledge will affect the way the research will be conducted (methodology) (Guba and Lincoln, 2005; Ryan et al., 2003; Bryman, 2001).

According to Weber (2004), there are two main research paradigms or philosophies adopted in social science research; positivism and interpretivism. The positivist approach is often related to quantitative research techniques, where the research designs is developed prior to initiating the research. In contrast, the interpretivist approach is generally conducted via qualitative research methods, where the reality of respondents' experiences is described towards the exploration of social relations (Sarantakos, 1998). The choice of either method depends on which of them can contribute to the objectives of the research effort. Both of the research philosophies will be explained in greater detail in the next section.

Positivism

According to Mcneill and Chapman (2005) positivists see sociology as the 'science of society' and believe that the behaviour of human beings can be objectively and scientifically measured in much the same way as the subject matter of the natural sciences. Sarantakos (1998) claimed that positivism is the oldest scientific theory, also known as a 'scientific approach' (Sekaran, 2003). According to Saunders et al. (2009), this paradigm has a long tradition in business and management research. For those working under this paradigm the world is perceived to be 'mathematically drafted' and thus they take mathematics as a guarantee of precision. Berg (1995) claimed that there is a general tendency for positivists to regard science as related to numbers, which implies accuracy. Therefore, those engaged in this particular paradigm mainly utilise the quantitative research techniques. These techniques of research have often in the past received more respect than their qualitative counterparts. The general approach is one where existing theory is used to develop hypotheses which are then tested and confirmed, wholly or partly, or refuted by the research carried out. This process leads to further development of theory which will be tested further in future research (Saunders et al., 2009).

Positivism according to Remenyi et al. (1998, pg. 32) is 'working with an observable social reality and thus the end product of such research can be law-like generalisations similar to those produced by the physical and natural scientists'. They further clarify that 'the researcher is independent of and neither affects nor is affected by the subject of the research' (Remenyi et al., 1998, pg. 33). Thus, positivists aim to be value-free in the sense that they should be external to the process of data collection and also data analysis. That is, they allow data to speak and do not impose their interpretation on the information.

Table 3.1: Assumptions of the Positivist Paradigm

Assumption	Question	Quantitative
Ontological	What is the nature of reality?	Reality is objective and singular, apart from the researcher
Epistemological	What is the relationship of the researcher to that researched?	Researcher is independent from that being researched
Axiological	What is the role of values?	Value free and unbiased
Rhetorical	What is the language of research?	Formal
		Based on set definitions
		Impersonal voice
		Use of accepted quantitative words
Methodological	What is the process of the research?	Deductive process-cause and effect
		Static design- categories isolated before study
		Context-free
		Generalization leading to prediction, explanation and understanding
		Accurate and reliable through validity and reliability

Source: Collin and Hussey (2009) as adapted from Creswell (2009)

Under positivist principles, there are assumptions that scientific method should ideally have characteristics as shown in Table 3.1. Based on these ontological assumptions concerning the nature of reality, this research should be objective and external to the researcher. Under these epistemological assumptions, positivists believe that only phenomena that are observable and measurable can be validly regarded as knowledge (Collis and Hussey, 2009). The axiological assumption here is concerned with the role of values and the extent to which the researcher will be imposing his/her values or predispositions on the results. That is, sociologists should be neutral and should not

allow their personal or political opinions and prejudices to bias any aspect of their research method or their interpretation of the data collected. Positivists have developed sampling techniques and rules of questionnaire design, as well as a practice of maintaining a distance from the people whom they are studying in order to maintain what they regard as objective control (Mcneill and Chapman, 2005).

Interpretivism

Interpretivism, an alternative to positivism, is generally known as a 'qualitative' paradigm (Collis and Hussey, 2003) or phenomenology (Remenyi et al., 1998). There are certain data or experiences that cannot be expressed by numbers (Berg, 1995). Thus, this interpretivist paradigm is different from the positivist approach in the way it seeks to understand and explain human and social reality (Crotty, 1998). According to Remenyi et al. (1998, pg. 34), interpretivism is 'a theoretical point of view that advocates the study of direct experience taken at face value, and one which sees behaviour as determined by the phenomena of experience rather than by external, objective and physically described reality'.

Interpretivists believe that reality is subjective; it is what people perceive it to be. Interpretivism emphasises meanings and understanding, whereas positivism emphasises facts and predictions (Berg, 1995). Thus, this particular paradigm is constructed by sharing people's experiences and giving them meaning through sense-making processes. Easterby-Smith et al. (2008) point out that interpretivists focus on people's thinking, feelings and communications, either individually or collectively, by looking at the different constructions, meanings and interpretations they have. Collis and Hussey (2003) comment that explicit and implicit values within researchers guide them through their interpretation and the sense-making process. In the social sciences, qualitative

research methodologies have not been as predominant as quantitative research techniques, however, they have still made an impact both conceptually and theoretically (Bogdan, 1975). Indeed, recent works by Zimmerman (2001) and Hopwood (2002) have drawn fresh attention to the tension between positivism and interpretivism such that now there is considerable acceptance of interpretivism. The differences between positivism and interpretivism are summarized in Table 3.2.

Table 3.2: The differences between Positivism and Interpretivism

	Positivism	Interpretivism
The observer	Must be independent	Is part of what is being observed
Human interests	Should be irrelevant	Are the main drivers of science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progresses through	Hypotheses and deductions	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to simplest terms	May include the complexity of 'whole' situations
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reasons

Source: Easterby-Smith et al. (2004, pg. 30)

Fitzgerald and Howcroft (1998) provide a comprehensive summary of dichotomy between positivism and interpretivism which they divide in terms of ontology, epistemology, methodology and axiology (Table 3.3). The argument between 'hard' positivist / objectivist and 'soft' interpretivist/subjectivist research paradigms will continue and it should be recognised as 'somewhat vacuous' according to Fitzgerald and Howcroft (1998) because each of them has its own strengths and weaknesses. The decision to adopt a particular research paradigm rests with researchers, as they know

better their circumstances and their particular research questions. Once selected however, it must be comprehensively and coherently argued.

Ball and Foster (1982) claimed that an accounting researcher must recognise that 'good' accounting research might not fully satisfy either the disciplinary purist or the practising accountant. However, the researcher should try to achieve a balance between these two extremes. An accounting researcher, like any researcher, must identify the most suitable paradigm of the research in order to successfully engage in it to meet the stated research objectives. The development of research in finance and accounting has a long tradition in which positivism can be regarded as the dominant philosophy. Ryan et al. (2002) stated that 'positive' accounting research will construct theories and then validate those theories using possible large and unbiased samples by replicating the methods and results. According to the American Accounting Association (AAA), the most appropriate research philosophy or the most preferred method in accounting research is the 'hard' positivist/objectivist approach which is shown in Table 3.3. Research using this method refers to previous relevant studies in the area, using well-formulated theories and re-produces a model which is testable using hypotheses.

Table 3.3: 'Soft versus Hard' Research Dichotomies

HARD	SOFT
ONTOLOGICAL LEVEL	
Realist: Belief that external world consists of pre-existing hard, tangible structures which exist independently of an individual's cognition.	**Relativist:** Belief that multiple realities exist as subjective constructions of the mind. Socially – transmitted terms direct how reality is perceived and this will vary across different languages and cultures.
EPISTEMOLOGICAL LEVEL	
Positivist: Belief that world conforms to fixed laws of causation. Complexity can be tackled by reductionism. Emphasis on objectivity, measurement and repeatability.	**Interpretivist:** No universal truth. Understand and interpret from researcher's own frame of reference. Uncommitted neutrality impossible. Realism of content important.
Objectivist: Both possible and essential that the researcher remain detached from the research situation. Neutral observation of reality must take place in the absence of any contaminating values or biases on the part of the researcher.	**Subjectivist:** Distinction between researcher and research situation is collapsed. Research findings emerge from the interaction between researcher and research situation, and the values and beliefs of the researcher are central mediators.
Etic / Outsider / Objective: Origins in anthropology. Research orientation of outside researcher who is seen as objective and the appropriate analyst of research.	**Emic / Insider / Subjective:** Origins in anthropology. Research orientation centred on native/insider's view, with the latter viewed as an appropriate judge of adequacy of research.
METHODOLOGICAL LEVEL	
Quantitative: use of mathematical and statistical techniques to identify facts and causal relationships. Samples can be larger and more representative. Results can be generalised to larger populations within known limits or error.	**Qualitative:** Determining what things exist rather than how many there are. Thick description. Less structured and more responsive to needs and nature of research situation.
Confirmatory: Concerned with hypothesis testing and theory verification. Tends to follow positivist, quantitative modes of research.	**Exploratory:** Concerned with discovering patterns in research data, and to explain/understand them. Lays basic descriptive foundation. May lead to generation of hypotheses.
Deduction: Uses general results to ascribe properties to specific instances. An argument is valid if it is impossible for the conclusions to be false if the premises are true. Associated with theory verification/falsification and hypothesis testing.	**Induction:** Begins with specific instances that are used to arrive at overall generalisations which can be expected on the balance of probability. New evidence may cause conclusions to be revised. Criticised by many philosophers of science, but plays an important role in theory/hypothesis conception.
Laboratory: Precise measurement and control of variables, but at expense of naturalness of situation, since real-world intensity and variation may not be achievable.	**Field:** Emphasis on realism of context in natural situation, but precision in control of variables and behaviour measurement cannot be achieved.
Nomothetic: Group-centred perspective using controlled environments and quantitative methods to establish general laws.	**Idiographic:** individual-centred perspective which uses naturalistic contexts and qualitative methods to recognise unique experience of the subject.
AXIOLOGICAL LEVEL	
Rigour: Research characterised by hypothetico-deductive testing according to the positivist paradigm, with emphasis on internal validity through tight experimental control and quantitative techniques.	**Relevance:** External validity of actual research question and its relevance to practice is emphasised, rather than constraining the focus to that researchable by 'rigorous' methods.

(Source: Fitzgerald and Howcroft, 1998)

The study in this thesis reflects the principles of the quantitative approach or positivist philosophy. It will focus on the theories and variables that already exist in the literature. Collin and Hussey (2003) point out that a positivist is likely to be concerned with ensuring that any concepts used can be operationalized; that is, described in such a way that they can be measured. The approach is 'positive' in the sense of offering an objective and true account of nature and society (Easterby-Smith et al., 2002). The quantitative approach is objective in nature and concentrates on measuring phenomena and it involves collecting and analysing numerical data and applying statistical tests, whereas, in contrast, a qualitative approach is more subjective in nature and involves examining and reflecting on perceptions in order to gain an understanding of social and human activities (Hussey and Hussey, 1997).

3.2 Research Approach

In line with the positivist research paradigm, the research approach for this study is deductive, an approach that is engaged in 'testing theory'. The process of deduction starts from theory, leading to the development of hypotheses, followed by data collection, then a summary of findings where the hypotheses are confirmed or rejected and finally revision of theory takes place. By deduction, conclusions are drawn through logical reasoning (Ghauri and Gronhaug, 2005). In summary, by applying a deductive approach, the study developed a theory and hypotheses and designed a research strategy to test the hypotheses (Saunders et al., 2009). In the deductive mode, the logical process of deriving a conclusion is from a known premise or something known as true (Ghauri and Gronhaug, 2005). The use of survey questionnaires is a common data collection method for this deductive approach (Saunders et al., 2009).

An alternative approach is the inductive or the 'building theory', that is related to the interpretivist paradigm. In this approach, theory is developed from observations or empirical reality (Saunders et al., 2009).Research applying inductive approach starts with data collection, which is followed by analysing the data and making sense of it; finally, theory will be formed from these data. Collis and Hussey (2003) claimed that the inductive approach is theory-building, that is, it moves from individual observations to general patterns or laws. The researcher's interpretation has potential danger where misinterpretation or bias may occur that affects the results of the research. Easterby-Smith et al. (2002) point out that this kind of approach is normally applied when there is little or no previous knowledge about a particular topic, and hypotheses cannot be formed.

Ghauri and Gronhaug (2005) show the difference between deduction and induction, with the diagram as shown in Figure 3.2.

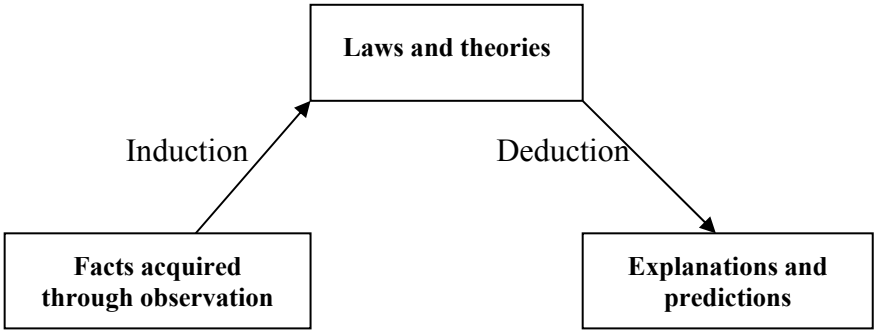


Figure 3.2: The Deductive and Inductive Approaches
(Source: Ghauri and Gronhaug, 2005)

3.3 Research Strategy and Data Collection Methods

According to Saunders et al. (2009) research strategies must be consistent with the research paradigm and research approach. There are a number of research strategies available for researchers in the field of business and management. Among them are case study, survey, experiment, action research, grounded theory, ethnography etc. Some of

these research strategies are more suited to either the deductive approach or inductive approach. For example survey and experiment often belong to the deductive approach while grounded theory and ethnography are used more in the inductive approach. Case study, however, can fit, to some extent, into both paradigms (Saunders et al., 2009).

Tomkins and Groves (1983) argued that an accounting researcher should not only occupy the scientific method as a privileged one, but should also consider other methods as they may be more appropriate in certain circumstances. One way to cope with this potential conflict is to employ a triangulation approach which is a combination of both methodologies (Sarantakos, 1998). By adopting both paradigms, according to Berg (1995), it is possible to avoid the disadvantages of particular methods and provide more flexibility when explaining complex social phenomena. Thus, to achieve the research objectives and answer the research questions, this study utilized elements of both quantitative and qualitative data collection. The research strategy for this current study was a survey, which is discussed in 3.3.1 below and selected interviews, which will be discussed in 3.3.2.Interviews can be both inductive and deductive. However in this current study, the interviews were to support the results from the survey. The survey and interviews were done at the same time, which is a cross sectional study. It was decided to use the cross sectional study because of time constraint and financial issues.

3.3.1 Survey Instrument

According to Saunders et al. (2009), survey is a popular and a common strategy in business and management research. The importance of this strategy for data collection in the behavioural sciences is widely recognised (Baruch, 1999). If surveys are constructed and administered appropriately, they can be a reliable source of large-scale

and high-quality data (Van der Stede et al., 2005). This method of data collection generally incurs low cost, while the questionnaires can be distributed and returned quickly (Bryman and Bell, 2007). In a positivist study, a survey methodology is designed to collect primary or secondary data from a sample, with a view to analysing them statistically and generalizing the results to a population (Collis and Hussey, 2009). Two types of surveys are descriptive and explanatory and this current study employed elements from both types of survey. The two fundamental questions of concern to society are what is going on (descriptive research) and why it is going on (explanatory research). These can be answered by surveys, which can be an effective way of describing phenomena and they have been used widely for this.

This study used a sampling approach to collect the data since it was impossible to collect data from the entire population of the hotel industry in Malaysia, because of various budgets and time constraints. The study was therefore cross-sectional in nature. Cross-sectional studies are designed to obtain research data in different contexts, but over the same period of time (Collis and Hussey, 2009). The data are collected once, over a short period of time, before they are analysed and reported and thus cross-sectional studies provide a snapshot of research phenomena. Cross-sectional studies are relatively inexpensive and are conducted simultaneously, so that there is no problem of change taking place in relation to different respondents due to the passage of time.

Probability sampling or representative sampling is most commonly associated with survey-based research strategies (Saunders et al., 2009). One of the five main techniques of probability sampling, stratified random sampling, was used for this study as the most suitable sampling frame. The entire population of the hotel industry is

divided into classes or star ratings and therefore, the researcher chose a sample from the whole population based on the star rating of the hotels.

For the purpose of data collection, a mail questionnaire was chosen, which is regarded as the first stage of data collection. One of the advantages of using this method is that responses are not affected by the interview. Postal distribution of the questionnaire is also easy to administer, although the response rate can be lower compared to other data collection methods. According to Saunders et al. (2009), the length of the questionnaire will affect response rate and the general rule is to keep questionnaires as short as possible. DeVaus (1996) argues that optimal length will depend on the population, research questions and objectives. Sekaran (2000) stated that a good covering letter, follow-up letter, stamped return envelopes and an appropriate length of the questionnaire can improve response rates.

The questionnaire and covering letter were posted to the sample; in this study, the senior accounting managers of three, four and five star hotels in Malaysia, to represent their hotels to obtain information about the external factors, internal dynamics and organisational impact of the AIS. The respondents who were representing the views of their department were the senior accounting managers in accounting department. They are the person who responsible to monitor the whole department. They know better about the AIS used, the performance of the staff in terms of AIS used, the problems with the AIS, how the problems were managed, etc. The respondents are also the person who links the department to the top management and to other departments. Most other studies on user satisfaction also employed the same method of survey questionnaire (e.g. Chin and Lee, 2000; Doll and Torkzadeh, 1988; Palvia, 1996). The details of the questionnaire design are discussed below.

3.3.1.1 Questionnaire Design

The questionnaire was designed to collect the data to achieve the objectives of the study (see Appendix 2) and it was prepared in the English language. It was not translated into the Malay language because the target respondents were all senior accounting executives in three, four and five star hotels in Malaysia, and it was expected that those respondents would not have a problem understanding the questionnaire in the English language. Senior persons in important departments in highly rated hotels, use the English language as the main language for communication in daily operations.

Findings about the extent to which the length of the questionnaire will affect response rates are mixed (DeVaus, 2002). The widespread opinion has been that a longer questionnaire will reduce response rates relative to a shorter questionnaire (Edwards et al., 2002). DeVaus (2002) advised not to make the questionnaire longer than is necessary to meet the research questions and objectives; but not to be obsessed with the length of the questionnaire. Sound questionnaire design principles should focus on three areas (Sekaran, 2003): the wording of the questions, planning how the variables will be categorized, scaled and coded after receipt of the responses and the general appearance of the questionnaire. All three are important issues in questionnaire design because they can minimize biases in research (Sekaran, 2003).

In line with the research framework presented earlier (Figure 2.12), the questionnaire was divided into three sections, namely external factors or inputs (which consisted of seven constructs); the internal dynamics (four constructs) and the output (one construct). For each of the constructs, the questions were developed by adapting previous research questions suitably modified to fit the current research context. The choice of the options and the order in which alternatives are presented sometimes

affects the probabilities of respondents selecting particular options (Foddy, 1993) and so great care was taken in both preparation and piloting. Among the information obtained from this survey was external factors that contribute to the *PU* and *PEOU* of using AIS, *usage* and *satisfaction* with the AIS and its *organisational impact* in the hotel industry in Malaysia. The measurement of each of the constructs is discussed below.

Measurement of External Factors

The selection of variables for external factors was based on previously reported studies in IT or IS. The seven variables or constructs are *TMS*, *ISS*, user *involvement*, *training*, user *experience*, *internal expertise* and *external expertise*. These constructs have been used extensively in previous studies of IT and IS (see e.g. Rouibah and Hamdy, 2009; Stone et al., 2007; Ismail, 2004; Liaw and Huang, 2003; Igbaria et al., 1997). Hence, the validity of the variables is vouched for by their frequent previous adoption.

TMS, *ISS*, user *involvement*, *training* and *internal expertise* were assessed using a range of assertions about the respondents' corporate environment. Constructs were measured by four items each, using a 7-point scale ranging from "1" (strongly disagree) to "7" (strongly agree). *External expertise* was also measured by four items; where firstly, a Yes or No answer was required. Secondly, where a Yes answer was given, the respondents were required to rate their level of satisfaction for each of the sources on a 7-point scale ranging from "1" (strongly dissatisfied) to "7" (strongly satisfied). Finally, user *experience* was measured by four items also using a 7-point scale from "1" (low) to "7" (high). This approach is entirely in line with previous research in this area.

Measurement of Internal Dynamics

The internal dynamics of the constructs of *PU*, *PEOU*, *usage* and *satisfaction* have been extensively researched in the area of IT and IS. This is shown by previously reported studies in the top journals of IT or IS (see e.g. Chen and Cheng, 2009; Stone et. al., 2007; McGill and Hobbs, 2003; Adamson and Shine, 2003; Lewis et al., 2003; Igbaria et al., 1997). This current study also employed those dimensions but in the context of Accounting Information Systems (AIS) in Malaysian hotels. The *PU* and *PEOU* items were proposed by Davis (1989). The items have been used in other studies (e.g.: Rouibah et al., 2009; Liu et al., 2006; Rai et al., 2002; Hong et al., 2002; Agarwal and Prasad, 1999). The extensive use of the constructs and the items justifies their use as fundamental determinants of user acceptance in the area of IT and IS and thus their use in this current study is valid.

There are no uniquely standardised items available to measure *usage* and *satisfaction*. This study adopted previously used questionnaire items to measure *usage* and *satisfaction* (e.g. Chen and Cheng, 2009; Wang and Liao, 2008; Wu and Wang, 2006; McGill and Hobbs, 2003; Rai et al., 2002). Those questions were modified accordingly to fit the objectives of the current study.

Both *PU* and *PEOU* were each measured by six items, whilst *usage* and *satisfaction* were each measured by five items. The respondents were asked to rate their answers on a 7-point scale from "1" (strongly disagree) to "7" (strongly agree).

Measurement of the Output - Organisational Impact

Measuring the use of IT and its *organisational impact* has long been seen as a major challenge for researchers and professionals (see e.g.: Kohli and Devaraj, 2003; Dehning

and Richardson, 2002; Barua and Mukhopadhyay, 2000). This current study examined *organisational impact* as the ultimate output from the hotels' investment in AIS. Perceived overall company performance such as impact upon operating costs, service quality, operating performance, customer loyalty, sales growth and overall performance of the company were included in the survey questions. The *organisational impact* items had been previously employed by various researchers (Gable et al., 2008; Ismail, 2004; Melville et al., 2004; Dehning and Richardson, 2002).

Respondents were asked to indicate their opinion about the AIS currently used in their hotels and the extent to which it affects each of the dimensions mentioned above. A 7-point scale ranging from "1" (no extent) to "7" (large extent) was applied. It was assumed that the hotels would use and invest in AIS intensively only if AIS met at least some of these performance criteria.

This current study adapted measurement items (for external factors, internal dynamic and output of the model) from related studies on IS success as shown in Table 3.4 below.

Table 3.4: The survey instrument and sources

Construct	Measurement items	Sources
Perceived Usefulness (PU)	1. Using AIS enhances our effectiveness on the job 2. Using AIS improves our job performance 3. Using AIS makes it easier to do our job 4. Using AIS in our job would enable us to accomplish tasks more quickly 5. Using AIS in our job increases our productivity 6. We find AIS useful in our job	Davis (1989)
Perceived Ease of Use (PEOU)	1. Learning to use AIS is easy for us 2. We find it easy to get AIS to do what we want it to do 3. Our interaction with AIS is clear and understandable 4. We find AIS is flexible to interact with 5. It is easy for us to become skillful at using AIS 6. We find AIS easy to use	Davis (1989)
Usage	1. The frequency of AIS use is high 2. Based on our experience, we use AIS 3. Our use of AIS is more than our original expectations 4. The use of reports or outputs from AIS is major in our job 5. We are dependent on AIS	Wang and Liao (2008); Rouibah and Hamdy (2009)
Satisfaction	1. We are satisfied with AIS effectiveness 2. We are pleased with the experience of using AIS 3. AIS has met our expectations 4. We are satisfied with AIS efficiency 5. Overall, we are satisfied with AIS	Seddon and Yip (1992); Hsieh and Wang (2007); Palvia (1996)
Organisational Impact	The use of AIS has 1. reduced operating costs 2. improved service quality 3. improved operating performance 4. improved customer loyalty 5. improved sales growth 6. improved overall performance of the hotel	Gable et al. (2008); Ismail (2004); Elbashir et al. (2008)
Top Management Support	1. TM makes an effort to provide stable funding for AIS development and operational activities 2. TM takes part in deciding in what order AIS should be implemented 3. TM is much concerned with the performance of AIS operation 4. TM strives to have the latest technology	Lee and Kim (1992)
Information System Sophistication	1. The hotel shares databases for various applications, rather than having a separate database for each application 2. There are integrated IS applications encompassing different functional areas 3. This hotel manages hotel-wide communication network services 4. This hotel has a good telecommunication infrastructure	Lee and Kim (2007)
Involvement	1. Accounting staff are involved in choosing and/or design of AIS 2. Accounting staff guide and direct the process of specifying and clarifying the input requirements and details for the AIS 3. Accounting staff guide and direct the process of specifying and clarifying the output requirements and details for the AIS 4. Accounting staff are involved in any modification and/or changes in AIS	Franz and Robey (1986); Rondeau et al. (2006); Rouibah and Hamdy (2009)
Training	1. Internal training of AIS is provided for accounting staff 2. There is clarity of end-users' role and objectives before training 3. IT support after training is available 4. Training programs precede effective AIS usage	Rouibah and Hamdy (2009)
Experience	1. Our experience in using AIS 2. Our experience in implementing AIS	Torkzadeh and Lee (2003)

	3. Our experience in maintaining/ modifying AIS 4. Overall, our AIS ability	
Internal Expertise	1. The accounting staff are adequate to manage tasks 2. The management are satisfied with the services provided by accounting staff 3. The accounting staff are skillful at using AIS 4. The IT staff are adequate to support the accounting system services	Yap et al. (1992)
External Expertise	Please indicate the following expertise you normally seek on matters regarding AIS and IS of your hotel 1. Consultants 2. Vendors/Dealers 3. Government agencies 4. Accounting/Auditing firms	Azizi (2004)

3.3.2 Semi-structured interviews

Interviews are a method for collecting data in which selected participants (the interviewees) are asked questions to find out what they do, think or feel. Interviews can be conducted with individuals or groups using face-to-face, telephone or video conferencing methods. This study adopted a semi-structured face-to-face interview, where the general direction of questioning was prepared, but the interviewer was able to add additional questions in order to obtain more detailed information about a particular answer or to explore new, but relevant issues that arose from a particular answer (Collis and Hussey, 2009). Even though the researcher had a list of themes and questions to be covered, these could be varied somewhat from interview to interview. The orders of questions could also be varied depending on the flow of the conversation.

The interpretation of survey questionnaire responses was informed by the results of semi-structured interviews with key respondents; in this study, senior managers in six of the sample hotels. The managers involved in the interviews were the managers in accounting departments and not the accountant. Thus, they were the users of the AIS. They were directly involved in using the AIS to prepare the reports/output. At the same time, as the senior managers in an important department of a hotel, they were also the users of the output from the AIS. So for this study, the respondents are both the primary

and secondary users. Semi-structured interviews may be used in an explanatory mode in order to understand the relationships between the variables. Semi structured interviews provided opportunity to 'probe' answers, where interviewees could explain or build on their responses. Interviewees may use words or ideas in a particular way, and the opportunity to probe these meanings will add significance and depth to the data obtained. They may also lead the discussion into areas that had not previously been considered but which are significant for the researcher's understanding. The result should be that researcher will be able to collect a rich and detailed set of data. Every care must be taken to obtain genuine responses from the interviewees in the way that the manner of the interaction with interviewees and the way questions are posed may impact on the data collected (Silverman, 1997; as cited in Saunders et al., 2009).

The use of two methods, or the mixed methods approach as mentioned earlier, was to check the accuracy of the data gathered by each method. That is, the survey questionnaire data could be verified by using follow-up interviews, which confirmed the validity of the researcher's questionnaire finding. Conducting semi-structured interviews provided a stronger insight into the phenomena being studied.

3.4 Data Analysis

After the collection of data, it was analysed to obtain the results and either accept or reject the hypotheses. This section will explain the methods used to analyse the data in this current study. It starts with the analysis of quantitative methods and then continues with the qualitative form of analysis.

3.4.1 Survey Data Analysis

Within social science research, Structural Equation Modelling (SEM) is seen as an increasingly popular method for data analysis, as opposed to first generation regression tools. Chin (1998a) claimed that SEM offers greater flexibility as compared to the first-generation techniques, such as principal components analysis, factor analysis, discriminant analysis, or multiple regression. The SEM flexibilities enable a researcher to (1) model relationships among multiple predictor and criterion variables; (2) construct unobservable latent variables (LV); (3) model errors in measurements for observed variables; and (4) statistically test a *priori* substantive/theoretical and measurement assumptions against empirical data (i.e., confirmatory analysis).

The first generation techniques have been generalized and extended by the use of the SEM. SEM explains relationships among multiple variables by examining the structure of interrelationships in a series of equations, which are similar to a series of multiple regression equations. SEM enables researchers to examine theory and measures simultaneously. In the SEM, a variable can play a double role, as an independent, as well as a dependent variable and thus, SEM is said to be superior compared to more traditional techniques because it allows for the explicit inclusion of measurement error and an ability to incorporate abstract and unobservable constructs (Fornell, 1982).

SEM is more suitable to theory testing rather than theory development because the SEM encourages confirmatory modelling. Byrne (2006) and Gefen et al. (2000) stated that SEM starts with a hypothesis, and then a specific model, based upon a rigorous review of previous related academic studies. It continues by operationalizing the constructs of interest with a measurement instrument and finally, tests the model.

There are two fundamental steps that are necessary to be completed when applying SEM, which is validating the measurement model and assessing the structural model. The former enables the use of several variables for a single independent or dependent variable and is accomplished through factor analysis. The latter relates independent to dependent variables and is achieved through path analysis. The SEM starts with testing the measurement model before continuing with the structural model (Byrne, 2006).

In a SEM model, each construct is conceptualised as a latent one, measured by multiple indicators or items (such as questions or statements from a survey instrument). When the measurement model is statistically validated, only then can one proceed to the next stage of assessing the structural model. In a structural model, constructs included are classified as either 'exogenous' (independent) or 'endogenous' (dependent), the determination of which is based on the hypotheses underpinning the model (Structural Equation Modelling, 2003).

The SEM represents two types of methods, which are (1) covariance-based; and (2) component based (also known as Partial Least Squares - PLS). The first method of the covariance-based SEM (CovSEM) according to Chin (1998b) is traditionally considered as the SEM method. It has a widespread availability of software programs such as LISREL and AMOS, and is a popular method among many research disciplines. However, the CovSEM requirements are sometimes not easily fulfilled by some research. Among the requirements are data normality, minimum number of cases and reflective indicators. This method also fails to be applicable to small data samples, which may result in improper solutions in some instances (Chin and Newsted, 1999).

The second method of component based SEM, also referred to as Partial Least Squares (PLS), and was developed partly to avoid some of the limitations found in the CovSEM. PLS according to Tenenhaus (2008) is a distribution-free approach that is presented in a two-step method, the measurement model and structural model. The differences between the CovSEM (represented by the LISREL which is the most widely known causal modelling technique) and PLS are outlined in Table 3.5.

Table 3.5: PLS versus LISREL

	PLS	LISREL
Objective	Prediction oriented	Parameter oriented
Approach	Variance based	Covariance based
Parameter estimates	Predictor specification (non parametric)	Typically multivariate normal distribution and independent observations (parametric)
Latent variable scores	Consistent as indicators and sample size increase (i.e., consistency at large)	Consistent
Epistemic relationship between a latent variable and its measure	Explicitly estimated	Indeterminate
Implications	Optimal for prediction accuracy	Optimal for parameter accuracy
Model complexity	Large complexity (e.g., 100 constructs and 1000 indicators)	Small to moderate complexity (e.g., less than 100 indicators)
Sample size	Power analysis based on the portion of the model with the largest number of predictors. Minimal recommendations range from 30 to 100 cases	Ideally based on power analysis of specific model – minimal recommendations range from 200 to 800 cases

(Source: Hoyle, 1999, p. 314)

Fornell (1982) calls PLS and LISREL (and other SEM techniques) as 'second generation' multivariate analysis. These second generation techniques enable the use of multiple dependent constructs, explicitly recognising error terms and integrating theory with empirical data. Thus, they provide greater capability to advance understanding by

combining theoretical with empirical knowledge, which is found not possible with the first generation techniques (such as multiple regression and principle components analysis) (Wang and Chang, 2005; Barclay et al., 1995). This current study employed the PLS approach because PLS is recommended for the analysis of small datasets of up to 100 cases. With 101 usable questionnaire responses, PLS was the most appropriate approach to adopt by this current study. The following section will explain and discuss PLS in more detail.

Partial Least Squares (PLS)

PLS is a second generation data analysis technique in the family of SEM methodological approaches. The basic PLS was developed by Wold in 1977 for the hard science of econometrics; however, PLS only gained popularity in chemometric research and industrial applications (Chin and Newsted, 1999). As opposed to the other SEM covariance based groups, PLS is a variance-based approach (Wang and Chang, 2005), and is a combination of principal components analysis relating measures (also called items) to constructs, and path analysis that allows for the construction of constructs systems (Barclay et al., 1995). A further explanation given by Joreskog and Wold (1982, p. 270) is that 'PLS is primarily intended for causal-predictive analysis in situations of high complexity but low theoretical information'. PLS is therefore aimed at best predicting latent variables by dependent variables, but the CovSEM objective is to obtain a good fit to the data. Therefore, it can be concluded that the intention of PLS is for prediction purposes and the CovSEM focuses more on parameter estimation.

The objective of PLS is to explain variance in the same way as regression and thus, PLS also provides the R^2 values and the significance of relationships among constructs to indicate how well a model is performing. One of the advantages of PLS over regression

is that PLS can handle numerous independent variables at the same time, even when these display multicollinearity. On the other hand, some of the assumptions that belong to regression are also shared by PLS, such as those concerning outliers and nonlinear data relationships etc.

The characteristics of PLS concerning minimal demands on measurement scales, sample size and residual distributions enable it to be used in a situation where relationships may or may not exist, and it can also be used to suggest propositions for later testing (Chin and Newsted, 1999). However, the conventional significance testing is not possible with PLS because the distribution of PLS is unknown. Smith and Langfield-Smith (2004) stated that the testing may be accomplished by re-sampling methods such as jackknifing and bootsrapping.

A small sample size can be handled with PLS because of the segmenting of complex theoretical models. According to Chin (1997) and Barclays et al. (1995), sample size requirements in PLS, is given by the 'rule of thumb' is ten cases per predictor. The predictors are either (a) the indicators (items) on the most complex construct; or the (b) the largest number of antecedent (exogenous) constructs leading to an endogenous construct, whichever is greater. In the case of this current study, the most complex constructs are *PU*, *PEOU* and *organisation impact* with 6 items respectively. Thus according to the rule, sample size requirement is 60 (6 times 10), while the largest numbers of antecedent constructs to an endogenous in this study are *PU* and *PEOU* which both have 4. Thus, the sample size requirement is 40 (4 times 10). The greater number of sample size requirements in the case of the current study is 60 from option (a).

The advantages offered by PLS are demonstrated by the recent increase in its use. PLS has been used in various fields of study, such as intellectual capital research (Wang and Chang, 2005; Bontis, 1998); marketing (Henseler, 2009); global integration (Birkinshaw et al., 1995); strategic management (Hulland, 1999); and information systems (Gefen and Straub, 2005; Pavlou, 2003).

Measurement model

The PLS-Graph 3.0 and Statistical Package for Social Sciences (SPSS) are used to analyse the measurement model in order to evaluate the reliability and validity of the measures. The measurement model is assessed by three steps, which are (1) individual item reliability; (2) internal consistency; and (3) convergent and discriminant validity. Each of the three processes will be discussed in greater detail below.

Individual item reliability – the first step to be taken in the measurement model is to assess the item reliability. As items are related to each construct, they will be assessed by evaluating the individual item loadings or simple correlations of the measures (items) with their respective construct. This is an important process in order to measure the amount of variance in individual items is due to its variables rather than to error. Carmines and Zeller (1979) recommended items loadings of 0.70 or more as an acceptable level, because it implies that there is more shared variance in the observed variable and its measures than with the error variance. Barclay et al. (1995) further clarify that all loadings are correlations, and thus when item loadings are 0.70 and above, this implies that more than 50% of the variance in the observed variable was shared with the construct. However, some authors have accepted a lower level of factor loading of only 0.50 (Julien and Ramangalahy, 2003; Chin 1998a). Significant deviations from acceptable reliabilities should be addressed in order to improve clarity

when drawing conclusions about the structural model. Any chosen low loadings need to be explained with reasons in the first instance (Chin 1998a).

An acceptance of low reliability loadings could result in a measure (item) being unreliable, if an item is sharing more in common with an alternative construct than with the construct being measured, and thus the construct in which the item is linked is multidimensional. However, a multidimensional construct could be resolved by splitting the construct into two or more constructs depending on the results generated. It could also be overcome by deleting items and thus, leaving only a unidimensional construct in the model (Barclay et al., 1995).

Even though Smith and Langfield-Smith (2004, p. 55) pointed out that 'there is no agreement regarding the absolute acceptable levels of fit or benchmarks for individual measures', acceptance of items with extremely low loadings could undoubtedly add little explanatory power to the model. Thus, Hulland (1999) recommended that items with factor loadings of less than 0.40 or 0.50 should be dropped.

Internal consistency – internal consistency or composite reliability is used to assess the reliability of the reflective measurement (Chin, 1998a). In PLS, researchers use Fornell and Larcker's (1981) measure (known as composite reliability) which is an alternative to the traditional Cronbach's alpha measure (known as internal consistency). These are similar, except that the Cronbach's alpha presumes that each item measuring a single construct contributes equally (Barclay et al., 1995). Fornell and Larcker (1981) thus, claimed that their method of measuring reliability is superior because they are using the item loadings estimated within the causal model and this is not influenced by the number of items in the scale. In the PLS path model, it is more appropriate to use the

Fornell and Larcker (1981) composite reliability measure, compared to the Cronbach's alpha internal consistency because the latter tends to over- or under-estimate the scale reliability. Nunally (1978) indicated 0.70 or greater as a benchmark value for "modest" reliability applicable in early stages of research and this is accepted as the best research practice to be followed for both internal consistency and composite reliability.

Convergent and Discriminant validity – both convergent and discriminant validity represent construct validity. Convergent validity is another measure of reliability and is assessed by using Average Variance Extracted (AVE) which is the average variance shared between a construct and its items (Barclay et al., 1995). AVE is used to measure the amount of variance captured by the scale items versus the amount of variance caused by the measurement error. An AVE loading greater than 0.50 is suggested by Fornell and Larker (1981), because if the loading is below the cut-off point suggested, it gives an implication that the variance due to measurement error is larger than the variance captured by the construct.

Discriminant validity is tested both at the individual measure (item) level and also at the construct level. It is a traditional methodological complement to internal consistency. In order to test for discriminant validity at an individual level, a matrix of loadings and cross-loadings is produced. Loadings of a measure with its associated construct is compared to its cross loadings with all of the other constructs in the model. Fornell and Larker (1981) pointed out that a measure (item) should load more highly to the construct it is required to reflect than to the other constructs. If an item loads more highly to the other constructs than it loads to its indicator, it should be excluded from the model.

At the construct level, discriminant validity indicates the extent to which the measures (items) which comprise a given construct differ from the items which comprises the other constructs in a particular model. The convergent validity measure is used to assess the discriminant validity at construct level (Fornell and Larcker, 1981). It is adequate for discriminant validity when a construct shares more variance with its items than it shares with other constructs in a given model. In order to assess the discriminant validity from the convergent validity measure, one should refer to (1) a correlation matrix which demonstrates the correlations between different constructs in the lower left off-diagonal elements of the matrix; and (2) the square roots of the AVE values calculated for each of the constructs along with the diagonal. According to Hulland (1999), the diagonal elements should be significantly greater than the off-diagonal elements in the corresponding rows and columns, for adequate discriminant validity.

Structural Model

In PLS, the structural model can be assessed after the measurement model validation is satisfied. That is, confidence has been gained with respect to the reliability and validity of the measures (items) comprising each construct. To assess the structural model, the statistical software application of the PLS-Graph version 3.0 will be used. In the structural model assessment, PLS will generate the path coefficients (standardised beta's) connecting various constructs in a model, as well as the R^2 values for the endogenous constructs. R^2 values produced by PLS in the structural model are a predictive power to determine the variance in the construct that is explained by the model (Barclays et al., 1995). These values are interpreted in the same manner as the R^2 values generated from the multiple regression analysis.

In PLS, re-sampling procedures are used to assess the significance of PLS parameter estimates. This is due to the unknown distribution of PLS, and thus, the conventional significance testing is not possible. PLS offers two types of re-sampling, being of jack-knifing and bootstrapping. In this current study bootstrapping was chosen because it allows the testing of the significance of parameter estimates from data which are not assumed to be multivariate normal (Barclay et al., 1995). According to Chin (1998a), a researcher can choose between the two methods, based on computational time and efficiency; the jack-knife being considered as an approximation to the bootstrap.

To run the bootstrap, the resample option can be chosen, with the PLS default of 100 re-samples where each sample consists of the same number of cases as the original sample set. The process of sampling will continue until the number of cases specified is reached. The bootstrap procedure will calculate the T-values of both paths and loadings of a particular model. From the results generated (the beta co-efficient and t-values), the hypotheses model and theory can be tested. The adjustments to the measurement model and the changes to the structural model suggested by the results of the analysis are part of the iterative process of theory development and robustness testing which is the hallmark of the PLS approach (Barclay et al., 1995).

3.4.2 Semi-structured Interviews

According to Easterby-Smith et al. (2004), there are two distinct ways of analysing qualitative data, which are content analysis and grounded analysis. The content analysis is more heavily based on numbers while the grounded analysis interprets the data based on feeling and intuition. Both, however, attempt to produce common or contradictory themes and patterns from the qualitative data used as a basis for interpretation

(Easterby-Smith et al., 2004). Table 3.6 shows the differences between content analysis and grounded analysis.

Table 3.6: Qualitative data analysis: content versus grounded methods

Content analysis	Grounded analysis
Searching for content (prior hypotheses)	Understanding of content and time
Fragmented	Holistic
Objective	Subjective: faithful to views of respondents
More deductive	More inductive
Aims for clarity and unity	Preserves ambiguity and contradiction

Source: Easterby-Smith et al. (2004, pg. 118)

Content analysis is more aligned with a hypothesis testing approach and is deductive in nature, rather than hypothesis generating and inductive. Neuendorf (2002, p.1) defined content analysis as 'the systematic, objective, quantitative analysis of message characteristics'. It utilizes a systematic method of reduction and analysis to produce the core constructs from textual data (Priest et al., 2002). It involves certain key phrases or words being counted, and the frequencies then being analysed. The selection of these would depend on the hypothesis to be proved or disproved (Easterby-Smith et al., 2004).

Two methods of content analysis that are frequently used when the data is in the form of transcripts of naturally occurring conversations between two or more people are conversation analysis (CA) and discourse analysis (DA). There are three fundamental assumptions to CA: (i). that all conversations exhibit stable, organised patterns irrespective of who is talking; (ii). that conversations are organized sequentially, and that it is only possible to make sense of a statement in relation to an on-going sequence of comments; and (iii). that analysis should be grounded in a detailed empirical

examination of the data. DA takes into account the broader social context in which the conversation takes place, and is therefore somewhat less concerned with detailed analysis of transcripts. DA does not restrict itself to conversations alone, and may use texts such as newspaper articles, computer conferences or advertisements as the basis for analysis (Easterby-Smith et al., 2004).

As a response to criticisms faced by content analysis, Priest et al. (2002) proposed a new version of content analysis, a qualitative content analysis, to ensure that text did not lose meaning through radical reduction. The qualitative content analysis can be undertaken through both manifest content, where the interpretations are drawn from interviewees' actual words, and latent content, where the interpretations are derived from the judgement of participants' responses (Woods et al., 2002).

Owing to its appropriateness to the nature of the research, this current study uses the qualitative content analysis outlined above to analyse the data. However, a detailed qualitative content analysis was not undertaken such as using a computer package for analysis. The extent of the interviews and their position in this current study is to support the interpretation and explanation of the quantitative findings.

3.5 Summary of the Chapter

This chapter has outlined the research approach to conduct the study. With regard to data collection method, a quantitative approach was selected as the most appropriate means to obtain the data with the use of a survey instrument. It was supplemented by semi-structured interviews to provide richer and deeper understanding about the findings and the topic under research. Thus, this current study has employed a mixed method approach.

Partial Least Squares (PLS), which is a form of Structural Equation Modelling (SEM), was chosen to analyse the quantitative data as it allows for smaller datasets. The requirements of PLS involve the validation of the measurement model and assessment of the structural model. The semi-structured interviews were analysed using a simple qualitative content analysis to confirm the results generated by the survey. Following the methodological approach pursued in conducting this current study, the next chapter describes further details about the data collection and descriptive statistics of the data.

CHAPTER FOUR
Data Collection and Descriptive Analysis

4.0 Introduction

This chapter will elaborate the descriptive statistics of the data collected. It starts with the administration of the survey and then continues with the descriptive analysis. In the final section of the chapter, the examination of missing data, outliers and univariate assumptions are discussed.

4.1 The Survey

Pilot Study

Pilot tests were conducted to refine the questionnaire (see section 3.3.1.1 above and Appendix 2) before the actual distribution took place. By performing a pilot study, any potential problems in the pro forma questionnaire can be identified and corrected or modified prior to the main administration of the survey instrument (Gill and Johnson, 1997). This process is important to improve the quality of the questionnaire by increasing the clarity of the questions.

Both academicians and practitioners were involved in the pilot study. The questionnaire was sent to two hotels in Malaysia, one three and one four star hotels. Those hotels had agreed to take part in the survey and therefore, they were removed from the actual study for pre-testing purposes. The questionnaire was also sent to two hospitality lecturers in Universiti Malaysia Sabah (UMS) and one questionnaire was sent to a hospitality lecturer in Universiti Malaysia Kelantan (UMK). They were asked to review the questionnaire for structure, readability, ambiguity and completeness (Dillman, 1991).

Another three questionnaires were distributed to PhD students in Hull University. Two were international students in hospitality and another was a Malaysian student from the management field of study. Based upon all the feedback received, corrections and improvements were made and some questions were removed, changed or subsequently re-worded as a result.

Population and Sample

For the purposes of the survey, the data were collected from a sample of hotels listed in the record of Tourism Malaysia and the Malaysian Association of Hotels (MAH). A list of three, four and five star hotels was obtained from those two sources. These are comprehensive lists of hotels in Malaysia, maintained by government organisations and updated regularly. The latest versions of the records were used and therefore there is confidence that the study used a complete list of Malaysia three, four and five star rated hotels. The list was limited to three, four and five star hotels, because lower rating star hotels are unlikely to engage in any sophisticated AIS. Thus, it was expected that the selected hotels were the most likely potential users of AIS which were appropriate to this research.

The criteria for the hotel rating in Malaysia provided by the Ministry of Tourism Malaysia are used as a guide in determining the sample in the study. The lists from the two sources were compared. Some hotels may be registered in both agencies but some hotels may only appear in one of the agencies. A total of 390 hotels registered with the Tourism Malaysia and 429 with the Malaysian Association of Hotels were involved in the research. Hotels which appeared in either list were called on the telephone to confirm their addresses, current status and to identify the individual best suited to respond to the survey.

The quality of respondents is an important factor in an empirical study. With regard to the current study, the respondents were required to have extensive knowledge about the accounting system currently use in their hotel. Therefore, for this study the senior accounting executive or accounting manager was identified as the target respondent.

Telephone calls were also made to each hotel in the final list to verify the name and addresses of the target respondents. During the calls, target respondents were also asked to agree to receive the questionnaire. This step was believed to increase the accuracy of the mailing process because it identified the most appropriate recipients. It also resolved issues concerning target respondents who might have left the hotels. There were also situations where the addresses supplied by the agencies did not indicate the target respondents' current work place. Thus the phone calls helped ensure that the questionnaire would be delivered to the right person and to the accurate address and this helped to ensure an acceptable response rate.

After the above refinement, a total of 367 hotels remained in the list. Those target respondents were sent the questionnaire with a cover letter stating the purposes and pointing out the significance of the study. Administering the questionnaire to appropriate respondents is important to increase the accuracy of replies (Chenhall and Langfield-Smith, 1998b).

It was explained to respondents that the questionnaires were pre-coded for company identification only and for the purpose of follow-up. To further ensure a high participation rate, all respondents were assured that neither their identity nor the

company details would be revealed to any third party and that all information disclosed would be treated as strictly confidential.

Together with the questionnaire and a cover letter, where necessary an envelope which was self-addressed and postage-paid was also provided. Additionally, all respondents received a small souvenir as a token of appreciation for taking part in the survey. They were also invited to participate in a prize draw of RM200 each for three respondents and all respondents were offered a copy of an executive summary of research findings. The prize was offered to cover any inconvenience of responding and to enhance the response rate. Any tendency to complete the questionnaire casually was managed by the scrutiny of the completed questionnaire. Moreover, the respondents were the senior accounting managers in accounts department, thus the prize draw of RM200 is considered small compared to their salary. The money did not a big factor to influence them to return the questionnaire.

Response Rate

A high response rate from as a wide a representation of the entire survey as possible is required in order to have dependable, valid and reliable results. There is no universal acceptable response rate since it depends upon so many other factors (Jackson and Furnham, 2000). If individuals who respond to a survey differ substantially from those who do not, then the results do not directly allow the researcher to infer how the entire sample would have responded (Gill and Johnson, 1997; Armstrong and Overton, 1977).

After one month, a total of 47 complete and usable questionnaires were returned. A first reminder was sent to the respondents who still had not returned the survey. The reminder was sent together with a questionnaire and with a self-addressed return envelope where necessary. A month after the first reminder was sent there were 41

further responses. However, 8 questionnaires were not usable, which resulted in only 33 usable responses.

A second reminder was sent to the balance of respondents in the list who had not yet responded. Together with the reminder letter was the questionnaire and also a stamped, self-addressed envelope where necessary. After a further one and a half months, only 29 further questionnaires were returned but 8 were not usable and two questionnaires were not fully answered. Telephone calls were therefore undertaken to both respondents to answer the remaining questions to complete their survey. After another one further month, however, no more questionnaires were received. It was thus decided to stop further reminders and continue with the data analysis. A total of 101 completed and usable questionnaires were gathered from a total of 367 mailed questionnaires, giving a response rate of 27.52%.

Where ever possible the covering letter was personalised by the name of the respondents. Furthermore, the questionnaire was delivered personally in a majority of cases. Thus this presented the opportunity to deliver and collect the questionnaire from respondents. Each questionnaire was examined for completeness and each response studied. Any absent responses were queried by telephone. If questionnaire were judged to have been completed inappropriately or casually, there were removed or not used (see page 114 above). The telephone calls were the first stage of ensuring the correct respondents to receive the questionnaire. Those refusing to join the survey were deleted from the lists. From the total of 13 states in Malaysia, the researcher or assistant went to 9 states and met the respondents personally, to give and collect the questionnaires.

There is no generally acceptable response rate; however, Baruch (1999) found a significant decline in reported response rates between 1975 and 1995 when he examined

five leading journals in the management and behavioural sciences. For research directed at senior organisational executive level, Baruch (1999) suggested a response rate norm of 36% +/-13%. For studies directed at employees at other organisational levels, he suggested a rate of 60% +/-20%.

Previously, Henderson (1990) argued that a response rate of between 20% and 30% is fairly typical for a postal survey administered to a large sample of firms. In a review of 183 business surveys in selected business journal publications since 1990, Dillman (2000) uncovered an average response rate of 21%. Therefore, the 27.52% response rate generated by this study is considered acceptable at a senior organisational executive level.

Evaluation of Non-response Bias

This survey was administered by post, therefore, it allowed for a large sample population to be covered simultaneously. However, there is a potential for the existence of bias when using the survey instrument as a primary source of data collection and when inferences are made about a population based only on a sample. It was, therefore, important to evaluate if any biases existed which could affect the integrity of data provided by the respondents. An independent samples t-test was conducted to compare the main key variables scores for early (47 replies) and late (54 replies) responses (surrogates for non-responses). Among the key variables chosen and tested were *TMS*, *training, AIS usage, AIS satisfaction* and *organisational impact*. The results showed that there was no significant difference in scores between the former and the latter responses (sig. 2-tailed value > 0.05).

In addition to the above test, the sample and population means for the number of rooms were compared for the respondents and the hotels in the responses which had not responded. Using the chi-square (χ^2) technique, there was no significant different between the mean responses and sampling frame for the number of rooms ($P > 0.05$). Therefore, it can be concluded that response bias with regard to the data collected from the respondents does not appear to pose a problem and the data can be generalized to the whole population of the hotels industry in Malaysia.

Semi-structured Interviews

Apart from the survey questionnaire, semi-structured interviews were also conducted in six of the surveyed hotels. The aims of these interviews were to have better understanding about the AIS adoption, usage and satisfaction in the operation of the hotels. The results of the survey would therefore be complemented by the details from the interviews. The reliability of the conclusions from the survey responses would be improved by the insights obtained from the interviews.

Semi-structured interviews are important in allowing the respondents to express opinions and to do so with greater richness and spontaneity. This kind of interview may prevent misunderstandings being drawn from the survey. Interviewers can also give a prepared explanation of the purpose of the study more convincingly than a covering letter will do. This method of data collection is used to validate the quantitative data findings despite possible criticism existing of its relative lack of rigour (Seuring, 2008; Ellram, 2006). From the respondents' point of view, an interview may be better and more valid because they do not have to just tick the boxes but are allowed to answer the questions and elaborate their views. Interview results may be more genuine and rich, though care must be taken to ensure that they are not biased and unreliable (Oppenheim,

1992). The six interviews will be discussed in detail in chapter 7. The interview schedule is shown in Appendix 3.

4.2 Descriptive Analysis

As a basis for understanding the characteristics of the sample in the study, this section presents some of the demographic information about the hotels that participated in the survey. The section starts with describing the background of the respondents and is followed by the profile of the responding hotels.

4.2.1 Profile of the Respondents

The target respondent for the questionnaire was the senior person in the accounts department, who represent the department and accounting users as a whole to the upper level management and also influence AIS design, IT utilisation and performance. Questions were about respondents' education level, number of years in position, number of years with hotel, experience with accounting systems and IT. The results are presented and discussed below.

Table 4.1: Current job title

Job title	Frequency	Percentage
Accountant / Account manager	48	50.0
Finance manager	30	31.3
General manager	3	3.1
Assistant accountant	15	15.6
Total	96	100.0

According to previous studies (e.g. Jobber, 1991; Frankfort-Nachmias and Nachmias, 1996) one of the weaknesses of mail questionnaires is that the researcher has no control over who answers the question. Table 4.1 exhibits the respondents' position in the sample. It can be seen that almost 85% of the respondents hold senior managerial positions. Of the respondents, most were accountants or accounts managers or finance

managers, who were expected to deal directly with the AIS. In certain hotels, the accounting and finance departments were combined and therefore, finance managers could be accepted as the senior person responsible for the accounting department.

Table 4.2: Level of education

Education	Frequency	Percentage
Master or higher	10	10.4
Degree	54	56.3
Diploma	27	28.1
SPM/STPM[1]	5	5.2
Total	96	100.0

1 This compares with the range O and A level

In order to obtain appropriate responses to the questionnaire it is important that respondents have experience in the hotel and in an accounting capacity. The extent of accounting and IT education received can be reflected from the educational levels of respondents. They were asked about their educational level as a background the accounting and IT, apart from their experience in the job. Table 4.2 shows the breakdown in relation to this information. A majority, or 56% of the respondents had a university degree and another 10% at university masters' level. A total of 28% had their diploma and only 5% of respondents with high school qualifications. It can be concluded that the respondents were sufficiently educated to provide reliable responses.

Table 4.3: Number of years in hotels

No. of years in hotel industry	Frequency	Percentage
Less than 1 year	2	2.0
1 to 5 years	51	52.0
Mora than 5 years to 10 years	23	23.5
More than 10 years	22	22.5
Total	98	100.0

Table 4.3 provides information about the number of years that respondents have worked in hotels which reflects the level of familiarity with the systems and operations of the hotels. From the total of 101 in the sample 98 respondents' answered these questions.

Only 2 respondents had less than one years' experience in the hotel industry. More than half of the respondents have between 1 to 5 years experienced in the systems used in hotel operations. This group of respondents appeared to have good knowledge about their tasks and also have a good grounding in the hotels' operations. Respondents who had 5 to 10 years' experience and more than 10 years in the hotel industry accounted for 24% and 23% respectively. It is believed that these two groups of respondents would have a high level of experience and familiarity with the hotels' operations as a whole and therefore, have sufficient knowledge to respond appropriately.

Table 4.4: Number of years in current position

Current position	Frequency	Percentage
Less than 1 year	5	5.1
1 to 5 years	45	45.9
Mora than 5 years to 10 years	31	31.6
More than 10 years	17	17.4
Total	98	100.0

The number of years in current position also reflects the level of managerial experience acquired in their current job and from which the respondents make their judgements as shown in Table 4.4. Almost half (49%) of the respondents had been in their current position for over 5 years and the balance of respondents (46%) had worked between 1 to 5 years in their current position.

Table 4.5: AIS experience

Experience in:	Little experience	Low experience	Average experience	Good experience	Extensive experience	Total
Using AIS	1 (1)	4 (4)		78 (79)	16 (16)	99 (100)
Implementing AIS	2 (2)	8 (8)		71 (73)	16 (17)	97 (100)
Maintain/modifying AIS	2 (2)	16 (17)		68 (72)	9 (9)	95 (100)
Overall AIS ability	1 (1)	3 (4)		66 (80)	12 (15)	82 (100)

numbers in the brackets ( ) refer to the percentage

Previous studies have shown that appropriate computer literacy directly affects satisfaction with computer based information systems (e.g.: Nelson and Cheney, 1987; Lee, 1986). In addition, it has been suggested that those with appropriate computer experience were more at ease when participating in AIS activities. Therefore, this study acknowledges accounting information systems experience as important knowledge that is expected to improve the usage and satisfaction with the AIS.

In the questionnaire, respondents were asked to indicate their experience with AIS on each of four dimensions of experience. The 7-point scale ranging from "1" (low) to "7" (high). To simplify the data, the responses for point scale 7 were called "extensive experience", point scales 5 and 6 were combined into one category called "good experience". Similarly, point scales 2 and 3 were combined into one category called "low experience" and point scale 1 called "little experience". The "neutral" category i.e. point scale 4 were called 'average experience'. Table 4.5 shows the breakdown of their experience to five groups of little, low, average, good and extensive experiences.

Almost all (95%) respondents had good to extensive experience in using AIS. Experience in implementing AIS shows a high percentage (90%) for respondents with experience from good to extensive experiences. Respondents also had important knowledge of maintaining and modifying AIS, with 81% of them having good experience or above. Again, 95% of them believed that they had good and extensive ability in overall AIS experiences so far. The slightly lower number of respondents being prepared to comment on their 'overall AIS ability' probably reflects their reluctant to make judgements about AIS they have not experienced.

4.2.2 Profile of the Responding Hotels

This section provides background information about the responding hotels such as type of ownership, size of hotel in terms of full time employees and number of rooms, star rating and turnover in Ringgit Malaysia (RM). According to the data (Table 4.6), the sample was almost equally split between independent and chain types of hotel. The Ministry of Tourism Malaysia uses certain criteria that determine a hotel rating and differentiates hotels according to their classes. The data shows the proportions of 50%, 28% and 22% respectively for each of the 3, 4 and 5 star hotels. The latest list of registered hotels published by the Ministry of Tourism Malaysia shows that 54% of all hotels are rated 3, 4 and 5 star.

Organisation size is characterized by turnover or by number of employees. Table 4.6 also classifies samples according to total number of full time employees. It shows that a full range of hotel size was covered. Approximately 29% had up to 100 employees and about 27% respondents came from hotels with full time employees between 101and 200. The balance of 44% respondents worked with over 200 employees. A somewhat similar picture emerged in relation to the number of rooms (Table 4.6); for example, almost 40% had between 151 – 300 rooms and almost 20% over 300 rooms.

Table 4.6: Profile of the responding hotels

Type of hotels	Frequency	Percentage
A chain hotel	45	45.5
An independent hotel	54	54.5
Total	**99**	**100.0**

Hotel star rating	Frequency	Percentage
3 star	51	50.5
4 star	28	27.7
5 star	22	21.8
Total	**101**	**100.0**

No. of full time employees	Frequency	Percentage
Less than 100	22	28.6
101 to 200	21	27.2
201 to 300	18	23.4
More than 300	16	20.8
Total	**77**	**100.0**

No. of rooms	Frequency	Percentage
Less than 150 rooms	44	43.6
151 to 300	38	37.6
More than 300	19	18.8
Total	**101**	**100.0**

Turnover (RM)	Frequency	Percentage
Less than 10 millions	30	44.8
10 million to 25 millions	25	37.3
More than 25 millions	12	17.9
Total	**67**	**100.0**

Turnover for the latest financial year was also requested by the survey; however, only 67 of the 101 responses provided this information. Almost one fifth of respondents had turnover greater than RM25 million. This along with full time employees' number

seemed to be considered highly confidential by certain hotels and probably difficult to compute (Table 4.6).

4.2.3 Output –Organisational Impact

In an attempt to understand the effectiveness of AIS implementation amongst the hotels in the sample, the respondents were asked to assess the impact of AIS on the overall performance of the hotel. Respondents were asked to indicate their opinion about the impact of AIS on each of six dimensions of performance, on a 7-point scale ranging from "1" (no extent) to "7" (large extent). To simplify the descriptive data (for descriptive purposes here only), the responses for point 7 was called "large extent", and points 5 and 6 were combined into one category called "considerable extent". Similarly, points 2 and 3 were combined into one category called "little extent" and point 1 called "no extent". Point 4 was called "some extent". Six dimensions of AIS performance were explored: (1) operating costs; (2) service quality; (3) operating performance; (4) customer loyalty; (5) sales growth; (6) overall performance.

Table 4.7 shows that a majority of all respondents at least agreed with all the statements concerning positive impact of AIS on the performance of their hotels. 100% of respondents from 5 star hotels at least agreed that AIS improved operating performance of the hotel (D and E). They also at least agreed that AIS improved service quality (C, D and E), improved overall performance of the hotel (87%), improved customer loyalty (78%), improved sales growth (86%) and 68% of 5 star hotels believed AIS could reduce operating cost (D and E).

For 4 star hotels, the results reveal that the AIS improved service quality (96%), followed by improved operating performance (93%), reduced operating costs (82%) and

improved overall performance of the hotel (75%). However the respondents of 4 star hotels showed less confidence that AIS improved customer loyalty and improved sales growth, as only 54% and 50% respectively at least agreed with these statements.

The results for the 3 star hotels show high agreement for almost all statements; they agreed that AIS improved operating performance (93%), improved overall performance of the hotel (91%), improved service quality (87%), reduced operating costs (83%), improved customer loyalty (71%) and improved sales growth (65%).

Only a small percentage of the hotels perceived that their AIS usage did not support their hotel achieving any of those objectives, whilst another small percentage perceived average impact of their AIS usage.

Any response to questions on these elements is inevitably open to some bias. However, such questions have been used in prior research. The average scores recorded in the research of other were compared to these results and they were not out of line (e.g.: Rouibah et al., 2009; Liu et al., 2006; Rai et al., 2002; Hong et al., 2002; Agarwal and Prasad, 1999).

Table 4.7: The extent of organisational impact

Dimensions / Hotel star rating	3 (n = 51)					4 (n = 28)					5 (n = 22)				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Reduced operating costs	2(4)	1(2)	6(12)	36(71)	6(12)	0	1(4)	4(14)	21(75)	2(7)	0	2(9)	5(23)	13(59)	2(9)
Improved service quality	1(2)	1(2)	5(10)	35(69)	9(18)	0	1(4)	0	23(82)	4(14)	0	0	1(4)	17(77)	4(18)
Improve operating performance	1(2)	0	3(6)	36(71)	11(22)	0	1(4)	1(4)	21(75)	5(18)	0	0	0	17(77)	5(23)
Improved customer loyalty	1(2)	7(14)	7(14)	30(59)	6(12)	0	5(18)	8(29)	14(50)	1(4)	0	0	5(23)	14(64)	1(4)
Improved sales growth	1(2)	6(12)	11(22)	27(53)	6(12)	0	9(32)	5(18)	14(50)	0	2(9)	0	4(18)	15(68)	0
Improved overall performance	1(2)	1(2)	3(6)	41(80)	5(10)	0	3(11)	3(11)	19(64)	3(11)	1(4)	1(4)	1(4)	16(73)	3(14)

numbers in the brackets ( ) refer to the percentage

The extent of AIS impact:

A = No extent
B = Little extent
C = Some extent
D = Considerable extent
E = Large extent

Note: Total end = 101

4.3 Descriptive Statistics

4.3.1 External Factors

In the questionnaire there were seven constructs which were the external factors that potentially influence the usage of AIS in hotels, with four items in each construct. Table 4.8 summarizes the results of the descriptive statistics for these external factors.

Generally, there was a high level of agreement with the assertion made in relation to the items of the *TMS*, *training* and *internal expertise* constructs; mean values for all items in those constructs are above 5. There were two items with lower level of agreement in the *involvement* construct which are 'accounting staff are involved in choosing and/or design of AIS' (mean 4.26) and 'accounting staff are involved in any modification and/or changes in AIS' (mean 4.59). This demonstrates a relatively low level of involvement of accounting staff in decisions about the AIS which will be returned to later in the thesis. The results also revealed the lowest mean for an *ISS* item which is 'the hotel shares databases for various applications, rather than having a separate database for each application' with only 4.79 mean value. The other items in the *involvement* and *ISS* constructs scored above 5 levels of agreements in all cases.

The mean scores for the *experience* construct showed that all respondents had a good level of experience in dealing with AIS as all four items have mean values above 5. These results are in significant contrast with the results for *external expertise* where the mean score for all four items were below 5. The highest mean was only 4.03 for 'vendors/dealers', followed by 'consultants' (mean 3.25), and 'accounting/auditing firms' (mean 2.62) and 'government agencies' (mean 1.42). The results revealed that the respondents were dissatisfied with external expertise provided to support AIS.

Table 4.8: Descriptive statistics for external factors

Constructs and items:	Mean	Std. Deviation	Range
Top Management Support (TMS)			
Top management (TM) makes an effort to provide stable funding for AIS development and operational activities	5.42	1.10	2 – 7
TM takes part in deciding in what order AIS should be implemented	5.52	1.26	3 – 7
TM is much concerned with the performance of AIS operation	5.48	1.17	1 – 7
TM strives to have the latest technology	5.19	1.27	1 – 7
Training			
Internal training of AIS is provided for accounting staff	5.59	1.23	1 – 7
There is clarity of end-users' role and objectives before training	5.43	1.19	2 – 7
IT support after training is available	5.41	1.29	1 – 7
Training programs precede effective AIS usage	5.48	1.22	2 – 7
Involvement			
Accounting staff are involved in choosing and/or design of AIS	4.26	1.74	1 – 7
Accounting staff guide and direct the process of specifying and clarifying the input requirements and details for the AIS	5.01	1.49	1 – 7
Accounting staff guide and direct the process of specifying and clarifying the output requirements and details for the AIS	5.00	1.41	1 – 7
Accounting staff are involved in any modification and/or changes in AIS	4.59	1.70	1 – 7
Information System Sophistication (ISS)			
The hotel shares databases for various applications, rather than having a separate database for each application	4.79	1.75	1 – 7
There are integrated IS applications encompassing different functional areas	5.11	1.36	1 – 7
This hotel manages hotel-wide communication network services	5.10	1.48	1 – 7
This hotel has a good telecommunication infrastructure	5.40	1.17	1 – 7
Experience			
Our experience in using AIS	5.74	1.00	1 – 7
Our experience in implementing AIS	5.50	1.26	1 – 7
Our experience in maintaining / modifying AIS	5.09	1.39	1 – 7
Overall, our AIS ability	5.60	0.99	1 – 7
Internal Expertise			
The accounting staff are adequate to manage tasks	5.71	0.96	2 – 7
The management are satisfied with the services provided by accounting staff	5.84	0.83	4 – 7
The accounting staff are skilful at using AIS	5.57	0.94	3 – 7
The IT staff are adequate to support the accounting system services	5.17	1.46	1 – 7
External Expertise			
Consultants	3.25	2.62	1 - 7
Vendors / Dealers	4.03	2.25	1 – 7
Government agencies	1.42	2.31	1 – 7
Accounting / Auditing firms	2.62	2.72	1 – 7

4.3.2 Internal Dynamics and Output

All together there were 22 items to measure the four constructs within the internal dynamics of the AIS. The respondents were asked to answer the questions based on their opinions about the AIS used in their hotels. All the respondents were asked to indicate their level of agreement with various assertions about the AIS, ranging from strongly disagree (score 1) to strongly agree (score 7). The results are presented in Table 4.9.

All the mean values for items in the *PU*, *PEOU*, *use* and *satisfaction* constructs scored above 5. This indicated a high level of agreement from the respondents about these characteristics of the AIS currently use in their hotels. However, in terms of range, there was a low variation in the responses with regard to those four constructs. On the other hand, it was found that the respondents indicated relatively low perception of the ability of AIS 'to improve public image and clients' loyalty' with a mean score of 4.95 and 'AIS has improved sales growth' with a mean value of 4.77. The remaining four items in the *organisational impact* construct had mean values over 5, which indicated a stronger positive opinion about AIS and its impact.

Table 4.9: Descriptive statistics for internal dynamics and output constructs

Constructs and items:	Mean	Std. Deviation	Range
***Perceived Usefulness* (PU)**			
Using AIS in our job would enable us to accomplish tasks more quickly	6.26	0.77	3 – 7
Using AIS improves our job performance	5.87	0.84	4 – 7
Using AIS in our job increases our productivity	6.01	0.81	3 – 7
Using AIS enhances our effectiveness on the job	5.99	0.79	3 – 7
Using AIS makes it easier to do our job	5.95	0.78	3 – 7
We find AIS is useful in our job	6.13	0.73	4 – 7
Perceived Ease of Use (PEOU)			
Learning to use the AIS is easy for us	5.89	0.80	3 – 7
We find it easy to get the AIS to do what we want it to do	5.76	0.95	2 – 7
Our interaction with the AIS is clear and understandable	5.82	0.82	3 – 7
We find the AIS is flexible to interact with	5.50	0.83	3 – 7
We find it easy for us to become skilful at using the AIS	5.75	0.86	3 – 7
We find the AIS is easy to use	5.86	0.80	4 – 7
Usage (USE)			
The frequency of AIS use is high	6.07	0.80	4 – 7
Based on our experience, we use AIS	5.89	1.03	1 – 7
Our use of AIS is more than our original expectations	5.51	0.89	3 – 7
The use of reports or outputs from AIS is major in our job	5.92	0.97	3 – 7
We are dependent on AIS	5.53	1.02	3 – 7
Satisfaction			
We are satisfied with AIS efficiency	5.57	1.06	2 – 7
We arepleased with the experienced of using AIS	5.76	0.92	3 – 7
We aresatisfied with AIS effectiveness	5.57	0.94	2 – 7
AIS has met our expectations	5.47	1.05	2 – 7
Overall, we aresatisfied with AIS	5.83	0.88	3 – 7
Organisational impact			
The use of AIS has reduced operating costs	5.19	1.16	1 – 7
The use of AIS has improved service quality	5.66	1.00	1 – 7
The use of AIS has improved operating performance	5.77	0.96	1 – 7
The use of AIS has improved public image and client's loyalty	4.95	1.24	1 – 7
The use of AIS has improved sales growth	4.77	1.37	1 – 7
The use of AIS has improved overall performance of the hotel	5.38	1.14	1 – 7

4.4 AIS Use by the Responding Hotels

The data is examined further by exploring the AIS use and adoption of AIS and IT by the responding hotels. Whilst this description is not part of the statistical analysis, their detail will be used later, in the discussion chapter.

Of the total respondents, 86 provided the name of accounting system currently use in their hotels. From the list provided (Table 4.10), UBS has the greatest use by the hotels in Malaysia. Other highly used accounting systems include SUN accounting system and IFCA. There were more than 30 different accounting systems used by the hotels, so the range of systems in use is quite wide.

Table 4.10: Types of AIS

Accounting Systems	Frequency	Percentage
BISTRAK Accounting	2	2
Fidelio Opera Reservation System	5	6
Fidelio Opera Reservation System and SUN accounting system	5	6
SUN accounting system	6	7
HOS	3	4
HOS and UBS	1	1
UBS	10	12
UBS and Roomaster	1	1
IFCA	7	8
IFCA and UBS	2	2
IFCA and CPS/HIS/SAP	2	2
Quickbook	2	2
OBM accounting system	2	2
Guest Centrix	3	4
Other accounting system (eg.: First accounting system, ACCPAC, MYOB, PACHTREE, PLATINUM, WINAC, WinAcc, XL Hotel Systems, Value Plus, Visual One, Windows Accounting, Yes Account etc.)	35	41
Total	**86**	**100**

4.5 Sophistication of AIS and IT in the Responding Hotels

The adoption of AIS and IT refers to the four dimensions of IT sophistication identified by Raymond and Pare (1992) which measures technological support, information content, functional support and management practices.

Dimensions of IT Sophistication

Raymond and Pare (1992) developed a multi-dimensional construct which includes aspects related to management practices, functional support, information content and technological support. They attempted to present an integrated view of the diverse approaches to characterising IT sophistication in the specific context of small and medium enterprises. A number of other studies also attempted to characterize the technology (see e.g.: Ismail, 2004; Cragg and King, 1992; Raymond, 1992; Kagan et al., 1990; Montazemi, 1987). Those studies selected various dimensions to reflect the sophistication of IT of an organisation. This current study looked at the sophistication of IT as defined by Raymond and Pare (1992) but only considered criterion variables that are believed to be important and reflect the IT development in the hotel industry in a Malaysian context.

The criterion variables of IT sophistication by Raymond and Pare (1992) are defined in Table 4.11.

Table 4.11: The criterion variables of IT sophistication

Perspective		Dimension	Criterion variables
IT usage	1.	Technological	Variety of IT used, hardware characteristics, development tools, man-machine interface, processing mode and type of operation.
	2.	Informational	Applications portfolio and integration of applications.
IT management	3.	Functional	IS personnel specialisation, role of the IS function, decisional level, type of development, position of the IS function and user participation.
	4.	Managerial	Organisational objectives, top management implication, IT investment, IT adoption process, presence of consultants, IT planning process, control of IT and evaluation of IT.

1. Technological Dimension

The types of IT adopted are shown in Table 4.12. The most common technologies adopted by the sample in the study were accounting-based applications (such as payroll, receivables, payables, general ledger, order entry and billing) which accounted for about 86% of the types of IT adopted. This finding is consistent with claims made by previous studies (e.g. Foong, 1999: Wilson and Sangster, 1992; Raymond and Magnenat, 1982) that accounting was the most important and widely used application. The next most adopted type was local area network (80%), while the remaining four technologies are adopted less frequently: external network (53%), database systems (52%), decision support systems and related management system both (46%). These findings are supported by the results of the interviews (see chapter 7).

Table 4.12: Types of IT

Types of IT / Hotel star rating	Total Number of positive responses			Total (n = 101)
	3 (n = 51)	4 (n = 28)	5 (n = 22)	
Accounting-Based Applications	43(84)	23(82)	20(91)	86(85)
Local Area Network	36(70)	24(86)	20(91)	80(79)
External Network	25(49)	15(54)	13(59)	53(52)
Database Systems	22(43)	15(54)	15(68)	52(51)
Decision Support Systems	21(41)	13(46)	12(55)	46(45)
Related Management Systems	14(27)	16(57)	16(73)	46(45)

numbers in brackets ( ) refer to the percentage

Looking at the results for hotel star rating, less than half of the 3 star hotels adopted database systems (such as personnel and other non-accounting systems), decision support systems (applications include word-processing, graphics and presentation packages, spread sheet and similar) and related management systems (application related to inventory management, purchasing, operation planning and control). The most important IT adopted by 4 star hotels were accounting-based applications and local area networks with 82% and 86% respectively, whilst decision support systems appeared to be the least important technologies for the 4 star hotels with only 46% adoption.

Accounting-based applications and local area networks were also the major technologies adopted by the 5 star hotels with an adoption rate of 91%. External networks (which are the communication systems that interconnects computers at geographically dispersed locations such as internet, electronic data interchange and external data sources) and decision support systems were the two least adopted by the 5 star hotels, with 59% and 55% respectively.

Table 4.13: Total number of ITs adopted

Number of ITs adopted / Hotel star rating	Total Number of positive responses			Total (n = 101)	Cumulative percentage
	3 (n = 51)	4 (n = 28)	5 (n = 22)		
0	5(10)	0(0)	1(4)	6(6)	100
1	8(16)	5(18)	2(9)	15(15)	95
2	5(10)	1(3)	0(0)	6(6)	80
3	11(21)	5(18)	3(14)	19(19)	74
4	4(8)	6(21)	3(14)	13(13)	55
5	14(27)	6(21)	4(18)	24(24)	42
6	4(8)	5(18)	9(41)	18(18)	18

numbers in brackets ( ) refer to the percentage

The number of technologies adopted by the responding hotels is also revealing. There were six technologies listed in Table 4.12 and therefore, the distribution of these values

ranged from one to six as presented in Table 4.13. The results suggest a moderate level of technological sophistication among the responding hotels as only 42% of the hotels had adopted at least five of the technologies listed, but 74% had adopted at least three of them. The results reveal differences between hotel ratings relating to the number of technologies adopted, with only 43% of 3 star hotels having adopted at least 4 technologies listed, whilst a higher percentage was evidenced by 4 and 5 star hotels with 61% and 73% respectively.

Table 4.14 reveals the breakdown of the types of processing adopted by the responding hotels, another important criterion of technological sophistication. The results show that there are differences between 3, 4 and 5 star hotels in terms of processing modes with 62% of 5 star hotels using two or more processing modes, whilst only 22% and 20% respectively of 4 star and 3 star hotels did so.

Table 4.14: Types of processing

Types of processing / Hotel star rating	Frequencies			Total (n = 98)	Cumulative percentage
	3 (n = 50)	4 (n = 27)	5 (n = 21)		
Batches only	17(34)	8(30)	3(14)	28(29)	100
Online batches only	9(18)	8(30)	0(0)	17(17)	70
Online batches and real time only	14(28)	5(18)	5(24)	24(24)	53
Batches and online batches	2(4)	1(4)	2(9)	5(5)	29
Batches and online real time	7(14)	2(7)	3(14)	12(12)	24
Online batches and online real time	0(0)	2(7)	5(24)	7(7)	12
Batches and online batches and online real time	1(2)	1(4)	3(14)	5(5)	5

numbers in brackets ( ) refer to the percentage

About 29% of the responding hotels indicated that their computer-based IS used batch-processing systems only, whilst almost 25% and 17% used 'online and real time' and 'online batch processing systems' respectively. The finding implies that, even though periodic processing data is still popular amongst Malaysian hotels, the trend is to move towards continuous or online and real time processing systems.

2. Informational Dimension

The applications portfolio is the criterion used to measure the informational dimensions of IT sophistication of the responding hotels. Table 4.15 shows the results of the types of computer applications used by the responding hotels. The results show that the hotels use and maintain the three basic accounting modules included in most of the popular accounting packages, i.e. accounts receivables (87%), accounts payable (86%) and general ledger (84%). Financial accounting also shows a high percentage (81%) from the responding hotels, followed by payroll with 74%. More than half of the hotels also maintain billing, online reservation, purchasing and inventory. However, the utilisation of management accounting types of modules such as cost accounting, budgeting, budget variances and operational planning and control is still minimal.

Table 4.15: Types of computer applications

Types of computer applications / Star rating		Frequencies			Total (n = 101)
		3 (n = 51)	4 (n = 28)	5 (n = 22)	
1.	Accounts receivables	43 (84)	25(89)	20(91)	88(87)
2.	Accounts payable	42(82)	26(93)	19(86)	87(86)
3.	General ledger	39(76)	27(96)	19(86)	85(84)
4.	Financial accounting	40(78)	23(82)	19(86)	82(81)
5.	Payroll	34(67)	23(82)	18(82)	75(74)
6.	Billing	27(53)	17(61)	15(68)	59(58)
7.	Online reservation system	25(49)	19(68)	14(64)	58(57)
8.	Purchasing	23(45)	18(64)	16(73)	57(56)
9.	Inventory	19(37)	18(64)	15(68)	52(51)
10.	Cost accounting	15(29)	7(25)	11(50)	33(33)
11.	Online payment and receipting system	17(33)	8(28)	7(32)	32(32)
12.	Budgeting	13(25)	13(46)	6(27)	32(32)
13.	Order entry	9(18)	12(43)	9(41)	30(30)
14.	Budget variances	7(14)	15(53)	6(27)	28(28)
15.	Personnel management	10(20)	6(21)	8(36)	24(24)
16.	Operational planning and control	11(22)	3(11)	3(14)	17(17)

numbers in brackets ( ) refer to the percentage

The adoption of other optional modules such as financial analysis, online payment and receipting, order entry and personnel management are also minimal. The result of this study is consistent with previous studies (e.g. Cragg, 1989; Montazemi, 1987; Malone, 1985) which reveal that most of the hotels adopted transaction-oriented systems to support operational and administrative tasks.

Table 4.16: Total number of applications conducted

Number of application conducted / Star rating	Number of positive responses			Total (n = 101)	Cumulative percentage
	3 (n = 51)	4 (n= 28)	5 (n = 22)		
0	1(2)	1(4)	2(9)	4(4)	100
1	4(8)	0(0)	0(0)	4(4)	97
2	2(4)	0(0)	0(0)	2(2)	93
3	2(4)	1(4)	1(5)	4(4)	91
4	2(4)	0(0)	0(0)	2(2)	87
5	7(14)	3(11)	0(0)	10(10)	85
6	6(12)	2(7)	2(9	10(10)	75
7	3(6)	1(40	1(5)	5(5)	65
8	6(12)	2(70	1(5)	9(9)	60
9	5(10)	3(11)	3(14)	11(11)	51
10	3(6)	5(18)	1(5)	9(9)	40
11	1(2)	0(0)	2(9)	3(3)	31
12	0(0)	4(14)	5(23)	9(9)	28
13	4(8)	3(11)	2(9)	9(9)	19
14	2(4)	2(7)	1(5)	5(5)	10
15	2(4)	1(4)	0(0)	3(3)	5
16	1(2)	0(0)	1(5)	2(2)	2

numbers in brackets ( ) refer to the percentage

Table 4.16 represents the total number of applications adopted by the responding hotels in order to determine the level of informational sophistication. The distribution of the values, which range from 1 to 16, shows a moderate level of informational sophistication among the responding hotels as only 40% had adopted at least ten of the total of sixteen applications listed, but 85% had adopted at least five applications. Comparison amongst the star ratings shows that 55% of 5 star and 54% of 4 star hotels

had adopted at least 10 of the applications listed whilst only 26% of 3 star hotels had adopted the same number of applications.

3. Functional Dimension

The functional dimension of IT sophistication of the responding hotels was measured by the sources of software. Table 4.17 shows the results of several sources of software listed in the questionnaire. 5 star and 4 star hotels showed a high percentage (86% and 78% respectively)of use of external expertise to modify the purchased packages or external custom-developed software. It can be assumed that the 5 star and 4 star hotels are larger companies that need and can better afford to have the systems to fulfil their specific requirements of the hotel operations. Only 47% of 3 star hotels used external expertise to modify or custom-develop software because they are unlikely to have a large or separate IT department. Thus they resort to use of standard unmodified packaged (39%) purchased from vendors or in other words, they utilise ready-made (off-the shelf) packages.

Table 4.17: Sources of software

Sources of software / Hotel star rating	Number of positive responses			Total (n = 101)
	3 (n = 51)	4 (n = 28)	5 (n= 22)	
Standard-unmodified	20 (39)	7 (25)	5 (23)	32(32)
Standard-modified externally	18 (35)	13 (46)	12 (54)	43(43)
Externally custom-developed	6 (12)	9 (32)	7 (32)	22(22)
Standard-modified internally	6 (12)	5 (18)	1 (5)	12(12)
Internally custom-developed	4 (8)	3 (11)	2 (9)	9(9)

numbers in brackets ( ) refer to the percentage

The figures also show that internal modified and internal custom developed software is less featured. This finding suggests a reliance of hotels on external expertise such as vendors and consultants to assist them in modifying or developing their computer-based information systems.

4. Managerial Dimension

The managerial dimension of IT sophistication of the responding hotels was measured by exploring the IT planning process. Table 4.18 shows the results of the types of IT planning adopted by the sample in the study.

Table 4.18: Types of IT planning undertaken

Types of IT planning / Hotel star rating	Number of positive responses			Total (n = 101)
	3 (n = 51)	4 (n = 28)	5 (n = 22)	
Financial resources planning	25(49)	11(39)	14(64)	50(50)
Implementation planning	19(37)	17(61)	13(59)	49(49)
Information requirement analysis	17(33)	18(64)	12(55)	47(47)
Human resource planning	20(39)	6(21)	11(50)	37(37)
Post-implementation review	12(24)	11(39)	13(59)	36(36)

numbers in brackets ( ) refer to the percentage

The results show that there are differences in the types of IT planning between the 3, 4 and 5 star rating hotels. More than half of 5 star hotels conducted all IT planning listed with financial resources the highest at 64%, followed by implementation planning and post-implementation review each with 59%. Information requirement analysis and human resources planning were the least important types of planning conducted by the 5 star hotels, with 55% and 50% respectively.

The results reveal that 4 star hotels are more concerned about information requirement analysis and implementation planning than other IT planning, as 64% and 61% respectively of these hotels undertook these. The other three types of IT planning were less used, as only 39% of 4 star hotels engaged in financial resources planning and in post-implementation review.

Less than half of the 3 star hotels engaged in any of the listed IT planning types. Only 49% and 39% respectively conducted financial resources and human resources

planning. The remaining three planning aspects show low involvement by these hotels with only 37%, 33% and 24% respectively involved.

Looking at the overall results, these findings suggest that financial resource planning is the most important IT usage commonly considered by higher rated hotels in Malaysia. Implementation planning and information requirement analysis are also considered important to these hotels and this might be explained by the simplicity of the computer-based IS adopted as revealed in Table 4.11 and Table 4.13. The low percentage of human resource planning (37%) and post-implementation review (36%) adopted by the responding hotels might be explained by the lack of internal IT expertise among these hotels, as revealed in the interviews discussed in chapter 7.

Table 4.19: Total number of types of IT planning conducted

No. of types of IT planning conducted / Star rating	No. of positive responses			Total (n = 101)	Cumulative percentage
	3 (n = 51)	4 (n = 28)	5 (n = 22)		
0	9(18)	2(7)	3(14)	14(14)	100
1	18(35)	12(43)	3(14)	33(32)	86
2	8(16)	4(14)	4(18)	16(16)	54
3	9(18)	1(4)	1(5)	11(11)	38
4	3(6)	5(18)	6(27)	14(14)	27
5	4(8)	4(14)	5(23)	13(13)	13

numbers in brackets ( ) refer to the percentage

Table 4.19 shows a summary of the number of types of IT planning adopted by the responding hotels. The data above reveals that 50% of 5 star hotels adopted at least four types of IT planning listed. This was followed by 4 star hotels with 32% undertaking of at least four types of planning. Only 14% of 3 star hotels adopted the same number of types of planning. A relatively high percentage of hotels did not have computer based IT planning at all (14%).

4.6 Data Preparation

Data examination is an important step to be taken before any further analysis is performed. This step is crucial and ensures more accurate results from the main analysis (Tabachnick and Fidell, 2007). Among the processes in the data examination are consideration of missing data, test for outliers and testing of assumptions.

4.6.1 Missing Data

According to Hair et al. (2010), missing data are information not available for a subject (or case) about which other information is available. Missing data often occurs when a respondent fails to answer one or more questions in a survey. In this current study, the first step taken when questionnaires were received was a screening process for errors and omissions of data. If there were errors or omissions of the data, phone calls were made to ask respondents to deal with any blanks or to clarify some answers. Therefore, it is considered that all completed questionnaires are free from missing data, except data for optional demographic profiles.

4.6.2 Outliers

Outliers can be explained as cases with values well above or well below the majority of other cases. Typically these are judged to be unusually high or low values on a variable or a unique combination of values across several variables that make the observation stand out from the others (Hair et al., 2010). According to Hair et al. (2010), there are two types of outliers which can be categorised as either beneficial or problematic. They need to be viewed within the context of the analysis and should be evaluated by the types of information they may provide. Beneficial outliers are different from the majority of the sample, they may be indicative of characteristics of the population that would not be discovered in the normal course of analysis. In contrast, problematic

outliers are not representative of the population, are counter to the objectives of the analysis, and can seriously distort statistical tests.

There were a few steps taken to check for potential outliers in this current study. They can be detected in a histogram, by looking for data points sitting on their own, on the extremes, or using a boxplot, where SPSS identifies scores which it considers are outliers compared to other scores. All the outliers' scores were checked to ensure they were genuine and not just an error from the data entry or miscoding. The next step was to check the descriptive table to indicate how much of a problem these outlying cases were likely to be. The 5% trimmed mean and mean values were compared to see the differences. This comparison can show whether the extreme scores have a strong influence on the mean. After all of these processes were undertaken to identify the outliers and ascertain their type of influence, it was concluded that the two mean values (5% trimmed mean and mean) of all the variables in this study were very similar and therefore, all the outliers were retained in the analysis due to the belief that they represent a valid element of the population (Hair et al., 2010).

4.6.3 Testing the Assumptions

Testing the assumptions is the final step in examining the data underlying the statistical bases for multivariate analysis. The process is important as a foundation for other multivariate techniques that make statistical inferences and present results. According to Hair et al. (2010), the need to test the statistical assumptions is because of two characteristics of multivariate analysis. First, complex relationships arise from a large number of variables; therefore, more potential distortions and biases occur when the assumptions are violated. Second, the complexity of the analyses and results may mask indicators of assumption violations apparent in simpler univariate analyses. Thus it is

important to be aware of any assumption violations and the implications they may have for the estimation process or the interpretation of the results (Hair et al., 2010). There are a number of assumptions common to all the techniques. Among the tests of the multivariate assumptions are level of measurement, independence of observations, normality, homoscedasticity and linearity. Each of the tests is explained below.

Level of Measurement

The scale of measurement for the dependent variables should be interval or ratio (continuous). This gives a researcher a wider range of possible techniques to use when analysing the data. All the dependent variables in this current study used a continuous scale.

Normality tests

Normality refers to the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution (Hair et al., 2010). Normality is considered the most fundamental assumption in multivariate analysis. The normality test is important because if the shape of the data departs from normality, unless handled correctly, it may lead to invalid statistical results.

To assess the normality of the distribution, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed for all variables (see Appendix 4 for the results of the tests). A non-significant result (sig. value of more than 0.05) indicates normality. The results show the sig. values are 0.000, suggesting violation of the assumption of normality. In these cases, most of the variables that depart from normality predominantly show negative skewness (skew to the right). This situation is quite common in studies with a large sample of more than 30 (Pallant, 2010). A negative skewness does not necessarily

indicate a problem with the scale, but rather reflects the underlying nature of the construct being measured (Pallant, 2010). PLS has advantage over other SEM techniques that make it well suited to this study. PLS does not require any normality assumptions and handles non-normal distributions relatively well (Chin, 1998a). PLS employs bootstrapping to test the significance of relationships so it works well with non-normal data (Efron, 1988).

Apart from the above tests, normality should be tested together with histograms, Q-Q plot and also by obtaining skewness and kurtosis values. Histograms present the actual shape of the distribution for each group or construct. In these cases, scores appeared to be reasonably normally distributed. The results were then supported by inspections of the normal probability plots (labelled normal Q-Q plot). The plots for each construct were performed by plotting the observed value for each score against the expected value from the normal distribution. Reasonably straight lines suggest normal distributions.

Homoscedasticity

This test is related primarily to dependence relationships between variables. Homoscedasticity refers to the assumption that dependent variable(s) exhibit equal levels of variance across the range of predictor variable(s) (Hair et al., 2010). In other words, the variability in scores for variable X should be similar at all values of variable Y. The variance of the residuals about predicted dependent variable scores should be the same for all predicted scores (Pallant, 2010). Homoscedasticity is desirable because the variance of the dependent variable being explained in the dependence relationship should not be concentrated in only a limited range of the independent values (Hair et al., 2010). The scatterplot is used to refer to this relationship. The results for the tests show

a fairly even cigar shape along its length which implies no major problem with homoscedasticity.

Linearity

Linearity is the requirement that the relationship between two variables should be linear. A scatterplot is used to test linearity. To have linearity, the scatterplot of scores should produce a straight line (roughly) and not a curve.

4.7 A Preliminary Analysis of Correlation

Before validation of the measurement model for PLS is performed in the next chapter, it is important to undertake a preliminary analysis of the data for correlation. Correlation is a statistical technique used to describe the strength and direction of the linear relationship between two variables. For this purpose, a Pearson product-moment correlation coefficient (r) is presented even though the data in this study shows that most of the variables skew to the right. For this study, it was decided to continue using the parametric technique because normality is not essential if a good sample size is achieved, as suggested by Pallant (2010). It was argued that most of the approaches are fairly "robust", that is, they will tolerate minor violations of assumptions, particularly if the study has a good sample size (Pallant, 2010).

From the results generated, the direction of the relationship can be determined by examining the sign of the correlation coefficient. A negative sign means there is a negative correlation between the two variables. High scores on one are associated with low scores on the other. The correlation results also show the value of the correlation coefficient. This value can range from -1.00 to 1.00. The strength of the relationship between the two variables will be determined by this value. A correlation of 0 indicates

no relationship at all, while a correlation of 1.00 indicates a perfect positive correlation, and a value of -1.00 indicates a perfect negative correlation (Pallant, 2010). Cohen (1988, p. 79-81) suggested the following guidelines to interpret the strength of the relationship:

r = 0.10 to 0.29 ⟶ small strength
r = 0.30 to 0.49 ⟶ medium strength
r = 0.50 to 1.00 ⟶ large strength

The results of the correlation analysis of the relationships in the study are presented in Figure 4.1. The results show that there are positive correlations between all relationships in the study, with the internal dynamics relationships generating strong correlations with values of the correlations all above 0.50. The input or the external factor relationships produced mixed results. Only internal expertise to PEOU relationship has strong correlation, whereas, ISS to PU and external expertise to PEOU relationships show no significant correlations. The remaining external factors relationships have medium strength correlations with values ranging between 0.342 and 0.454. Finally, the correlation for the relationship between satisfaction and organisational impact also shows a medium strength, $r = 0.443$, $n = 101$, $p < 0.01$.

It is also important to check that the correlation between each of the independent variables is not too high. Pallant (2010) advised not to include two variables with a bivariate correlation of 0.70 or more in the same analysis. If this situation occurs, the researcher needs to consider omitting one of the variables or forming a composite variable from the scores of the two highly correlated variables. The results presented in Figure 4.1 show that the highest correlation between independent variables is 0.501 which is the correlation between training and internal expertise. This correlation is less than 0.70; therefore all variables were retained.

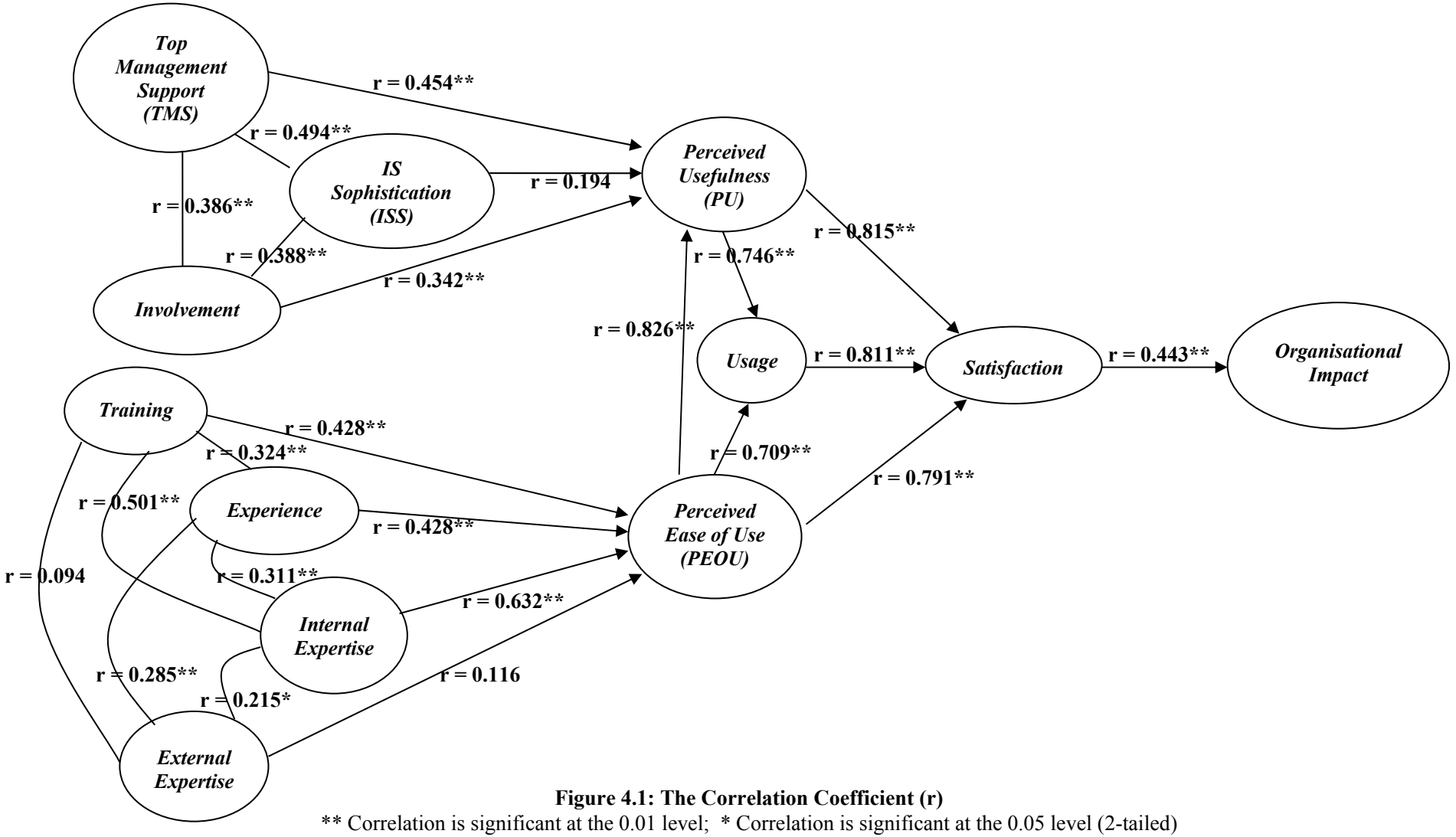


Figure 4.1: The Correlation Coefficient (r)

** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level (2-tailed)

4.8 Summary of the Chapter

This chapter answered the first objective of the study, which was to describe the extent to which the 3, 4 and 5 star hotels in Malaysia adopted IT and *ISS* in order to support the use of AIS. The chapter also provided an understanding of some of the characteristics of the hotels, as well as those of the respondents themselves. It then reported the initial screening and preparation of the data for further analysis. Based on the background of this chapter, further analysis will be possible, particularly in exploring the other objectives of the research.

CHAPTER FIVE
Validation of Measurement Model

5.0 Introduction

The aim of this chapter is to describe the process of validating the measurement model for each of the items used in the study and thus fulfil the requirements of the Partial Least Squares (PLS) statistical approach. The measurement model within a PLS approach evaluates the relationship between measures and constructs by examining the individual item reliability, internal consistency and discriminant validity of the scale measures. This section starts with the purification using the corrected-item total correlation. It continues with exploratory factor analysis (EFA) for the factor structure with the aim of establishing initial validity, using Cronbach's alpha and composite reliability for internal reliability, T-coefficient and PLS analysis. This study used both software applications of the Statistical Package for the Social Sciences (SPSS) and also PLS-Graph version 3.0 which was developed by Dr. Wynne Chin.

The purification process was undertaken by examining the corrected-item total correlation (CITC) score which indicates the degree to which each item correlates with the total values of a construct. According to Pallant (2010), low values of less than 0.30 indicate that the item is measuring something different from the scale as a whole. The CITC score is a good indicator of internal consistency where each item in a construct is measured by Cronbach's alpha coefficient. Items were considered for removal if their CITC scores were below 0.30 (Pallant, 2010) or below 0.50 (Li, 2002) unless reasons were given to support the decision to keep those items. Some items may also be deleted even if the scores were above the threshold if the overall reliability is improved dramatically by deleting those items. The impact of removing each item from the scale is given by the 'alpha if item deleted' score.

After the purification test, an exploratory factor analysis (EFA) was undertaken to gather information about the interrelationships among the set of variables. The EFA is conducted using the principal component analysis (PCA) and varimax method of factor rotation with Kaiser's criterion or eigenvalue rule. The varimax rotation criterion centres on simplifying the columns of the factor matrix and helps to make the pattern of the items associated with a given factor more distinct (Kim, 1975). The varimax method attempts to minimise the number of variables that have high loadings on each of the factors. In PCA the original variables are transformed into a smaller set of linear combinations, with all of the variance in the variables being used (Pallant, 2010). PCA is a better choice if all that is needed is an empirical summary of the set of data (Tabachnick and Fidell, 2007). The eigenvalue of a factor represents the amount of the total variance explained by the factor (Pallant, 2010) and therefore, only factors with an eigenvalue of 1.0 or more are considered significant or retained for further investigation (Everitt and Dunn, 1983).

Internal item reliability was assessed by examining the loadings or simple correlations of the items to their respective constructs. The loadings are evaluated using a rule of thumb by accepting items with loadings of 0.70 or more. According to Carmines and Zeller (1979) items with loadings of 0.70 or more imply that there is more shared variance between the construct and its measures than with the error variance. Barclay et al. (1995) further explained that as loadings are correlations, this indicates that more than 50% of the variance (loading squared) in the observed measure (item) is shared with the construct. If the 0.70 loading threshold is not reached, generally the item will be removed from the construct, unless valid reasons are given to keep the item for further testing. Factor loadings lower than 0.50 are not reported in this study to streamline the final results.

5.1 Validation of External Factor Constructs

The external factors consist of seven constructs of *TMS*, *training*, user *involvement*, *ISS*, *internal expertise*, *external expertise* and *experience*. A criterion for selection of these external variables is that they have been employed frequently in IS research as factors influencing IS success. All of these have been investigated critically in previous implementation factor research and were included as main influencing factors. This study made use of the items used in previous studies (e.g.: Venkatesh et al., 2008; He and King, 2008; Colquitt and LePine, 2000; Choe, 1999; Raymond, 1990) with some refinement to suit the current study. There are 28 items altogether in the external factors with 4 items for each construct.

5.1.1 Factor Analysis

To validate the external factor constructs, the first step undertaken was the purification before administering factor analysis as recommended by Churchill (1979). Table 5.1 presents the results of the purification test. The results show that each item in the constructs has a CITC factor loading above the cut-off points of 0.30 (Pallant, 2010) and Cronbach's alpha above 0.70 except for the *external expertise* construct. Therefore, all items in all the other six constructs were transferred to factor analysis, reported later in this section. A closer inspection of *external expertise* identifies that two items with low CITC scores are **EE1**- consultants (0.282) and **EE2**- accounting/audit firms (0.317). Cronbach's alpha is 0.616 for the *external expertise* construct. Item EE2 is above the cut-off point of 0.30, however, deleting this item will dramatically improve the reliability to 0.767. Therefore, in this study it was decided to remove both items of EE1 and EE2 from further tests, leaving only two remaining items for the *external expertise* construct and 26 items in total for the external factors, on which further tests were conducted.

Table 5.1: Purification for items of external factors

Items		CITC-1	CITC-2	Cronbach's Alpha
Top Management Support				
TMS1	Provide stable funding for AIS development and operational	0.705		0.864
TMS2	Takes part in deciding order of AIS should be implemented	0.672		
TMS3	Concerned with the performance of AIS operation	0.751		
TMS4	Strives to have the latest technology	0.733		
Training				
TR1	Internal training is provided for accounting staff	0.767		0.917
TR2	Clarity of user's role and objectives before training	0.865		
TR3	IT support after training is available	0.805		
TR4	Training precede effective AIS usage	0.805		
Involvement				
INV1	Involved in choosing and/or design AIS	0.641		0.886
INV2	Guide/direct the process of specifying/ clarifying input requirements and details	0.823		
INV3	Guide/direct the process of specifying/ clarifying output requirements and details	0.811		
INV4	Involved in modification and/or changes in AIS	0.764		
Information Systems Sophistication				
ISS1	Shares databases for various applications	0.539		0.782
ISS2	Integrated IS applications	0.579		
ISS3	Manages hotel-wide communication network services	0.733		
ISS4	Has a good telecommunication infrastructure	0.546		
Internal Expertise				
IE1	Staff are adequate to manage staff	0.629		0.759
IE2	Management satisfied with accounting staff	0.655		
IE3	Staff are skilful at using AIS	0.651		
IE4	IT staff are adequate to support accounting systems	0.438		
External Expertise				
EE1	Consultants	0.282		0.767
EE2	Accounting/audit firms	0.317		
EE3	Vendors/dealers	0.564	0.630	
EE4	Government agencies	0.448	0.630	
Experience				
EXP1	Experience in using AIS	0.773		0.914
EXP2	Experience in implementing AIS	0.856		
EXP3	Experience in maintaining/modifying AIS	0.784		
EXP4	Overall AIS ability	0.869		

Before running the factor analysis for the 26 remaining items of the external factors, it was important to test whether the items were suitable or not for that process. Therefore, the Kaiser Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's Test of Sphericity were carried out. To proceed with factor analysis, the value for KMO should be 0.60 or above and the Bartlett's value 0.05 or smaller. Norusis (1992) quoted Kaiser (1974) who suggested that a KMO measure in the 0.90's is considered as 'marvellous' sampling adequacy for factor analysis purposes; the 0.80's as 'meritorious'; the 0.70's as 'middling'; the 0.60's as 'mediocre'; the 0.50's as 'miserable' and below 0.50's as 'unacceptable'. The results of the tests (Table 5.2) show that the KMO value is 0.806 and the Bartlett's test is significant (p=0.000) and hence it is appropriate to proceed with factor analysis.

Table 5.2: KMO and Bartlett's Test applied to external factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	1921.337
	Df	325
	Sig.	.000

The factor analysis for the 26 items was conducted (Table 5.3) with 21 items loading above the 0.70 threshold. The remaining five items (highlighted) loaded below the requirement of 0.70. The five items are: **TMS1**- provide stable funding for AIS development and operations; **IE3**- staff are skilful at using AIS; **IE4**- IT staff are adequate to support accounting systems; **ISS2**- integrated IS applications; **ISS4**- has a good telecommunication infrastructure.

Table 5.3: Rotated Component Matrix[a]

Items	Component						
	1	2	3	4	5	6	7
TMS1	.622						
TMS2	.790						
TMS3	.789						
TMS4	.761						
TR1		.793					
TR2		.827					
TR3		.828					
TR4		.853					
INV1			.802				
INV2			.800				
INV3			.800				
INV4			.861				
ISS1				.771			
ISS2				.604			
ISS3				.824			
ISS4				.561			
IE1					.736		
IE2					.770		
IE3					.630		
IE4					.593		
EE3						.885	
EE4						.866	
EXP1							.832
EXP2							.901
EXP3							.860
EXP4							.902

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Hair et al. (2010) provided guidelines (Table 5.4) for identifying significant factor loadings based on sample size, giving a factor loading of 0.55 for 101 responses. The five items are below the 0.70 loading threshold in the factor analysis but they are above the 0.55 loading suggested by Hair et al. (2010). Apart from the 0.70 rule of thumb

loading threshold, this study followed the guidelines suggested by Hair et al. (2010). Therefore, those items above the 0.55 factor loadings are retained in the study.

Table 5.4: Guidelines for identifying significant factor loadings based on sample size

Factor Loading	Sample Size Needed for Significance[a]
0.30	350
0.35	250
0.40	200
0.45	150
0.50	120
0.55	**100**
0.60	85
0.65	70
0.70	60
0.75	50

aSignificance is based on a 0.05 significance level (α), a power level of 80 percent, and standard errors assumed to be twice those of conventional correlation coefficients. Source: Hair et al. (2010) page 117

A further test was undertaken for the five items below the 0.70 loading threshold. Communalities for the items below 0.70 loading threshold (Table 5.5) but above 0.55 as suggested by Hair et al. (2010) are all well above the 0.40 threshold. These communalities values give information about how much of the variance in each item is explained. Low communality values could indicate that the item does not fit well with the other items in its component (Pallant, 2010). Therefore, all items with loadings above 0.55 (Table 5.5) are retained in the study as they are considered to be significant (Hair et al., 2010).

Table 5.5: Cronbach's Alpha and loadings for the three constructs

Construct	Cronbach's Alpha	Items with loading below 0.70		Communalities
Top Management Support	0.864	TMS1	0.622	0.710
Internal Expertise	0.759	IE3	0.630	0.756
		IE4	0.593	0.645
Information Systems Sophistication	0.782	ISS2	0.604	0.707
		ISS4	0.561	0.566

The remaining two items (EE3 and EE4) in the *external expertise* construct require further investigation. The questionnaire asked the respondents to indicate whether they seek for *external expertise* of consultants, vendors/dealers, government agencies and accounting/audit firms regarding their AIS and IT. Firstly, a Yes and No answer was required. Secondly, where a Yes answer was given, the respondents were required to rate their level of satisfaction for each of the sources on a seven-point Likert scale (1 = strongly dissatisfied to 7 = strongly satisfied). For the item EE3, only 29 respondents from a total of 101 respondents gave a yes answer and rated their level of satisfaction. As for the second item of EE4, 51 respondents gave a Yes answer. The means (Table 5.6) were1.4158 and 2.6238 respectively for item EE3 and EE4, which indicates an extremely low satisfaction level with *external expertise*. However, with only two items of 29 (23%) and 51(45%) respondents respectively for each item, this does not represent a reasonable number and is not in line with the rest of the sample in the study. Therefore, it was decided to remove the *external expertise* construct from further analysis within this section, though it will receive comment in later discussion of the findings.

Table 5.6: Individual item reliability for the constructs

Items		Mean	S.D.	Factor Loading	Communalities
TMS1	Provide stable funding for AIS development and operational	5.4158	1.09788	0.622	0.710
TMS2	Takes part in deciding order of AIS should be implemented	5.5248	1.26170	0.790	0.712
TMS3	Concerned with the performance of AIS operation	5.4752	1.17127	0.789	0.789
TMS4	Strives to have the latest technology	5.1881	1.27053	0.761	0.771
TRN1	Internal training is provided for accounting staff	5.5941	1.23433	0.793	0.790
TRN2	Clarity of user's role and objectives before training	5.4257	1.18614	0.827	0.886
TRN3	IT support after training is available	5.4059	1.28979	0.828	0.807
TRN4	Training precede effective AIS usage	5.4752	1.22143	0.853	0.834
INV1	Involved in choosing and/or design AIS	4.2574	1.73582	0.802	0.685
INV2	Guide/direct the process of specifying/ clarifying input requirements and details	5.0099	1.49329	0.800	0.856
INV3	Guide/direct the process of specifying/ clarifying output requirements and details	5.0000	1.41421	0.800	0.823
INV4	Involved in modification and/or changes in AIS	4.5941	1.70398	0.861	0.792
ISS1	Shares databases for various applications	4.7921	1.75110	0.771	0.724
ISS2	Integrated IS applications	5.1089	1.36309	0.604	0.707
ISS3	Manages hotel-wide communication network services	5.0990	1.47990	0.824	0.785
ISS4	Has a good telecommunication infrastructure	5.3960	1.16687	0.561	0.566
IE1	Staff are adequate to manage staff	5.7129	.96267	0.736	0.711
IE2	Management satisfied with accounting staff	5.8416	.83346	0.770	0.811
IE3	Staff are skilful at using AIS	5.5743	.94177	0.630	0.756
IE4	IT staff are adequate to support accounting systems	5.1683	1.46335	0.593	0.645
EE3	Vendors/dealers	1.4158	2.31200	Removed	Removed
EE4	Government agencies	2.6238	2.72342	Removed	Removed
EXP1	Experience in using AIS	5.7426	.99653	0.832	0.789
EXP2	Experience in implementing AIS	5.4950	1.26193	0.901	0.841
EXP3	Experience in maintaining/modifying AIS	5.0891	1.38636	0.860	0.798
EXP4	Overall AIS ability	5.6040	.99075	0.902	0.859

5.1.2 Convergent and Discriminant Validity

In PLS, validity is assessed in terms of convergent validity and discriminant validity. Convergent validity signifies that a set of indicators represents one and the same underlying construct, which can be demonstrated through their uni-dimensionality (Henseler et. al., 2009). The use of the average variance extracted (AVE) as a criterion of convergent validity is suggested by Fornell and Larcker (1981). An AVE value of at

least 0.5 indicates sufficient convergent validity, meaning that a latent variable is able to explain more than half of the variance of its indicators on average (Go¨tz et al., 2009, cited in Henseler et al, 2009).

Table 5.7 shows the internal validity for the external factor constructs and it is noted that the results for cronbach's alpha and composite reliability are well above the 0.70 threshold level for all constructs. The AVE for all variables are above the 0.50 cut-off point and thus, the internal validity for the external factor constructs are said to be sound and appropriate for further analysis.

Table 5.7: Internal validity for external factor constructs

Constructs	Cronbach's Alpha (α) 0.7 Nunnaly, 1978	Composite Reliability (Pc) 0.7 Fornell & Larcker, 1981	Average Variance Extracted (AVE) 0.5 Fornell & Larcker, 1981
Top Management Support	0.864	0.909	0.713
Training	0.917	0.942	0.802
ISS	0.782	0.865	0.616
Involvement	0.886	0.925	0.757
Experience	0.914	0.946	0.814
Internal Expertise	0.759	0.872	0.632
External Factor	0.785	0.856	0.502

Two measures of discriminant validity should be performed in PLS path modelling, which are the Fornell–Larcker criterion and examination of the cross- loadings. Fornell and Larcker (1981) suggested that a latent variable should share more variance with its assigned indicators than with any other latent variable. In simple words, the AVE of each latent variable should be greater than the latent variable's highest squared correlation with any other latent variable (Henseler et al., 2009). Chin (1998) and Go¨ tz et al. (2009) stated that the loading of each indicator is expected to be greater than all of its cross-loadings. Although the Fornell–Larcker criterion assesses discriminant validity

on the construct level, the cross-loadings allow this kind of evaluation on the indicator level (Henseler et al., 2009).

The discriminant validity for the external factor constructs was computed (Table 5.8) and in each case the square root AVE of each construct was much larger than the correlation of the specific construct with any of the other constructs in the model as required (Chin, 1998a). The external factor constructs are thus validated by the tests that were carried out.

Table 5.8: Discriminant validity

Constructs	TMS	Training	ISS	Involvement	Experience	Internal Expertise	External Factors
TMS	**0.844**						
Training	0.535	**0.895**					
ISS	0.514	0.456	**0.785**				
Involvement	0.409	0.373	0.400	**0.870**			
Experience	0.308	0.339	0.331	0.259	**0.902**		
Internal Expertise	0.609	0.509	0.320	0.488	0.370	**0.795**	
External Factors	0.806	0.754	0.708	0.685	0.542	0.779	**0.708**

After the external factor constructs were validated, with some items deleted, the factor analysis was run again and the result is shown below. The KMO is improved to 0.818 significant at 0.000 and all factors are loaded in each component above 0.55. The confirmed items were then transferred to PLS and the loading of the PLS was compared to the loading of the SPSS (Table 5.9).

Table 5.9: SPSS and PLS loadings for the external factors construct

Variable	Measurement Item	SPSS Loading	PLS Loading	SPSS Communalities
Top Management Support				
TMS1	Stable funding for AIS development & operational	0.617	0.8531	0.708
TMS2	Takes part in deciding order of AIS should be implemented	0.796	0.7978	0.721
TMS3	Concerned with the performance of AIS operation	0.798	0.8444	0.785
TMS4	Strives to have the latest technology	0.742	0.8634	0.743
Training				
TRAIN1	Internal training is provided for accounting staff	0.816	0.8594	0.782
TRAIN2	Clarity of user's role and objectives before training	0.820	0.9299	0.875
TRAIN3	IT support after training is available	0.824	0.8905	0.805
TRAIN4	Training precede effective AIS usage	0.848	0.9007	0.831
Information Systems Sophistication				
ISS1	Shares databases for various applications	0.746	0.7097	0.677
ISS2	Integrated IS applications	0.576	0.7796	0.684
ISS3	Manages hotel-wide communication network services	0.833	0.8523	0.791
ISS4	Has a good telecommunication infrastructure	0.605	0.8261	0.572
Involvement				
INV1	Involved in choosing and/or design of AIS	0.801	0.7444	0.682
INV2	Guide/direct the process of specifying/ clarifying input requirements and details	0.806	0.9552	0.857
INV3	Guide/direct the process of specifying/ clarifying output requirements and details	0.806	0.9540	0.826
INV4	Involved in modification and/or changes in AIS	0.869	0.8317	0.796
Experience				
EXP1	Experience in using AIS	0.834	0.8960	0.780
EXP2	Experience in implementing AIS	0.900	0.9103	0.838
EXP3	Experience in maintaining/modifying AIS	0.858	0.8605	0.784
EXP4	Overall AIS ability	0.900	0.9384	0.857
Internal Expertise				
IE1	Staff are adequate to manage staff	0.741	0.8137	0.712
IE2	Management satisfied with accounting staff	0.764	0.9006	0.787
IE3	Staff are skilful at using AIS	0.615	0.8815	0.740

IE4	IT staff are adequate to support accounting systems	0.603	0.622	0.640

The Cronbach's alpha and composite reliability for external factors (Table 5.10) reached the threshold, while the AVE is slightly less than the rule of thumb of 0.50. However, the result is close to the requisite 0.50 convergent validity level and is acceptable because of the exploratory nature of the research and the fact that it has met and exceeded all other statistical validation requirements (Hair et al., 2010). Statistical appropriateness of each of the items of *TMS*, *Training*, *Involvement*, *ISS*, *Internal Expertise* and *Experience* constructs was confirmed and these were subject to a series of further statistical validation tests, which will be described later in the chapter.

Table 5.10: Final validation of external factors construct

External Factors	Mean	S.D.	A	Pc	AVE
Top Management Support	5.4010	1.01371	0.781	0.853	0.496
Training	5.4752	1.10369			
Involvement	4.7153	1.37524			
ISS	5.0990	1.13141			
Internal Expertise	5.7096	.78974			
Experience	5.4827	1.04478			

Key: S.D.= Standard Deviation; A=Cronbach's Alpha; Pc=Composite Reliability; AVE=Average Variance Extracted

5.2 Validation of Internal Dynamics and Output Constructs

5.2.1 Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)

Each item in *PU* and *PEOU* was taken from Davis (1989) with some changes in wording to suit this current study. For the current study, respondents to the survey instrument were initially asked to indicate the extent to which acting as representative of the accounting function they were satisfied with twelve statements about the *PU* and *PEOU* of the current AIS within their respective hotels via a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

5.2.2 Usage and Satisfaction

The two constructs of *usage* and *satisfaction* are based on DeLone and McLean's Information Systems (IS) Success Model which was first published in 1992 based on theoretical and empirical IS research conducted by a number of researchers between 1981 and 1987. There were no measures of *usage* and *satisfaction* produced by DeLone and McLean; however, other studies developed a number of items to measure both constructs. This study adapted both constructs as appropriate for this specific AIS research. The *Satisfaction* and *use* constructs were measured with a 10-item scale where each item was adapted to specifically reference AIS. Ratings were made on a seven-point scale (1 = strongly disagree to 7 = strongly agree).

5.2.3 Output – Organisational Impact

The final construct is the impact of the use and satisfaction with the AIS in the hotel industry. *Organisational impact* is the main dependent variable in this study. Any comprehensive contingency studies should include a performance variable as suggested by accounting (e.g. Otley, 1980) and IS (e.g. Weill and Olson, 1989) literatures. There are various approaches used to measure performance, for example, from a financial or non-financial standpoint or through the use of objective measures or subjective measures. This study focuses on subjective measures of *organisational impact* and an instrument used by previous studies (e.g. Azizi, 2004 and Khandwalla, 1977) was adopted. Subjective measures of performance have been shown to correlate strongly with objective measures and the use of subjective measures is highly recommended when accurate objective measures are unavailable (Dess and Robinson, 1984).

5.2.4 Factor Analysis for Internal Dynamics and Output

The test for all the five constructs of *PEOU, PU, usage, satisfaction* and *organisational impact* started with reference to the CITC score to see if there were any items below the cut-off point of 0.30 and Cronbach's alpha below the 0.70 threshold. Table 5.11 shows that all 28 items in the five constructs were well above 0.30 for the CITC and 0.70 for internal reliability. Therefore, all items were retained in the study and it was appropriate to proceed with factor analysis, discussed in the following section.

Table 5.11: Purification for items in the five constructs

Items		CITC-1	A
PEOU1	AIS is easy to learn	0.590	0.874
PEOU2	AIS easy to do what it should do	0.702	
PEOU3	Interaction with AIS is clear and understandable	0.732	
PEOU4	AIS is flexible to interact with	0.656	
PEOU5	Easy to become skilful with AIS	0.658	
PEOU6	AIS is easy to use	0.735	
PU1	AIS accomplish tasks more quickly	0.695	0.904
PU2	AIS improves job performance	0.697	
PU3	AIS increases productivity	0.803	
PU4	AIS enhances effectiveness	0.794	
PU5	AIS usage make job easier	0.747	
PU6	AIS useful in job	0.687	
USE1	Frequency of AIS use is high	0.589	0.804
USE2	Using AIS easy to do job	0.620	
USE3	Use AIS more than expectations	0.584	
USE4	Outputs/reports from AIS is major in job	0.620	
USE5	Dependent on AIS	0.544	
SAT1	Satisfied with AIS efficiency	0.756	0.922
SAT2	Pleased with AIS experience	0.740	
SAT3	Satisfied with AIS effectiveness	0.847	
SAT4	AIS has met expectations	0.863	
SAT5	Overall, satisfied with AIS	0.796	
OP1	Reduced operating costs	0.432	0.868
OP2	Improved service quality	0.628	
OP3	Improved operating performance	0.727	
OP4	Improved customer loyalty	0.762	
OP5	Improved sales growth	0.767	
OP6	Improved overall performance	0.732	

In order to verify that the data set was suitable for factor analysis, the first tests were run, i.e. the Kaiser Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's Test of Sphericity. With KMO of 0.908 which is 'marvellous' according to Kaiser (1974) and Bartlett's test also at a very good (0.000) significant level (Table 5.12), factor analysis was suitable for the items in the five constructs.

Table 5.12: KMO and Bartlett's Test for the 28 items

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.908
Bartlett's Test of Sphericity	Approx. Chi-Square	2190.822
	Df	378
	Sig.	.000

The factor analysis of the 28 items from the SPSS shows that all items are loaded in each related component with factor loading above 0.70 (Table 5.12) except for one item: OP1 with 0.551 loading. If the rule of factor loadings based on sample size (Hair et al., 2010) is followed, this loading for OP1 is acceptable; however, further tests were undertaken before a decision to keep or remove item was taken. The Cronbach's alpha for the construct is 0.868 and if this item is deleted it will improve to 0.886. Communality for OP1 shows a loading of 0.304, which indicates that the item does not fit well with other items in its component (Pallant, 2010). Therefore, even though the SPSS loading reached the threshold set by Hair et al. (2010), other important determinants were taken into consideration and it was decided to remove the item from further tests.

Table 5.13: Factor loadings for the five constructs

	Component				
Items	1	2	3	4	5
PEOU6	.827				
PEOU3	.823				
PEOU2	.805				
PEOU5	.773				
PEOU4	.768				
PEOU1	.711				
PU3		.872			
PU4		.865			
PU5		.831			
PU2		.791			
PU1		.790			
PU6		.783			
USE2			.782		
USE4			.780		
USE1			.747		
USE3			.734		
USE5			.710		
SAT4				.921	
SAT3				.905	
SAT5				.873	
SAT1				.842	
SAT2				.831	
OP1					.551
OP2					.757
OP3					.827
OP4					.845
OP5					.857
OP6					.833

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization

All the remaining 27 items related to the five constructs were re-run again using the SPSS and the outcome was transferred to PLS for further analysis. Both loadings from SPSS and PLS (Table 5.14) are well above the threshold of 0.70.

All items in the five constructs have a mean score (Table 5.14) of over 5.0 which indicates quite a high agreement in all items except for OP4 and OP5 with values almost 5.0. The items in the constructs were taken from previously validated instruments in the literature (e.g.: Petter, 2009; Lin, 2007; Wu and Wang, 2006; Livari, 2005; Molla and

Licker, 2001; Gefen et al, 2000; Gefen, 2000; Davis, 1989) and this probably accounts for high loadings in each construct being reported. All the five constructs of *PEOU, PU, USE, SAT* and *OP* satisfied item-to-construct correlation for individual items and the data was now progressed with confidence for further statistical validation which will be described later in the chapter.

Table 5.14: Individual item reliability for the five constructs

Items		Mean	S.D	SPSS Loading	PLS Loading	Range
PEOU1	AIS is easy to learn	5.8911	0.79876	0.711	0.7347	3-7
PEOU2	AIS easy to do what it should do	5.7624	0.95025	0.805	0.8015	2-7
PEOU3	Interaction with AIS is clear and understandable	5.8218	0.81726	0.823	0.8283	3-7
PEOU4	AIS is flexible to interact with	5.4950	0.83215	0.768	0.7708	3-7
PEOU5	Easy to become skilful with AIS	5.7525	0.86494	0.773	0.7701	3-7
PEOU6	AIS is easy to use	5.8614	0.80037	0.827	0.8239	4-7
PU1	AIS accomplish tasks more quickly	6.2574	0.77011	0.790	0.7920	3-7
PU2	AIS improves job performance	5.8713	0.84455	0.791	0.7808	4-7
PU3	AIS increases productivity	6.0099	0.80616	0.872	0.8667	3-7
PU4	AIS enhances effectiveness	5.9901	0.79366	0.865	0.8636	3-7
PU5	AIS usage make job easier	5.9505	0.77944	0.831	0.8318	3-7
PU6	AIS useful in job	6.1287	0.73025	0.783	0.7972	4-7
USE1	Frequency of AIS use is high	6.0693	0.80321	0.747	0.7632	4-7
USE2	Using AIS easy to do job	5.8812	1.03235	0.782	0.7912	2-7
USE3	Use AIS more than expectations	5.5149	0.89010	0.734	0.7245	3-7
USE4	Outputs/reports from AIS is major in job	5.9208	0.96626	0.780	0.7816	3-7
USE5	Dependent on AIS	5.5347	1.01552	0.710	0.6878	3-7
SAT1	Satisfied with AIS efficiency	5.5743	1.06157	0.842	0.8492	2-7
SAT2	Pleased with AIS experienced	5.7624	0.91813	0.831	0.8316	3-7
SAT3	Satisfied with AIS effectiveness	5.5743	0.94177	0.905	0.9064	2-7
SAT4	AIS has met expectations	5.4653	1.05418	0.921	0.9173	2-7
SAT5	Overall, satisfied with AIS	5.8317	0.88396	0.873	0.8676	3-7
OP2	Improved service quality	5.6634	1.00277	0.774	0.8096	1-7
OP3	Improved operating performance	5.7723	0.95793	0.822	0.8616	1-7
OP4	Improved customer loyalty	4.9505	1.23593	0.839	0.8109	1-7
OP5	Improved sales growth	4.7723	1.37026	0.869	0.8343	1-7
OP6	Improved overall performance	5.3762	1.13887	0.854	0.8288	1-7

5.2.5 Internal Consistency

After achieving satisfactory internal consistency for all items in the study, the focus is now on the consistency at the construct level. Internal consistency was evaluated using both the composite reliability produced by PLS and also the Cronbach's alpha (Table 5.15). Internal consistency was based on the Fornell and Larcker (1981) measure of 0.70 as an indication of reliability. Cronbach's alpha is a traditional way of measuring the internal consistency where a threshold of 0.70 is indicated, in line with the best research practice (Nunnaly, 1978). This is suggested as a benchmark for "modest" reliability applicable in the early stages of research (Barclay et al., 1995). The results for the internal validity of Cronbach's alpha and composite reliability for all the constructs are well above the 0.70 cut-off points required by each test, which suggests that the parameter estimates, are sound.

Table 5.15: Internal consistency

Constructs	Cronbach Alpha (α) 0.7 Nunnaly, 1978	Composite Reliability (Pc) 0.7 Fornell & Larcker, 1981
External Factor	0.781	0.850
PEOU	0.874	0.898
PU	0.904	0.926
Usage	0.804	0.866
Satisfaction	0.922	0.942
Impact	0.886	0.917

5.2.6 Discriminant Validity

Discriminant validity at the item level was tested by the matrix of loadings and cross-loadings and the discriminant validity at the construct level was tested using the Average Variance Extracted (AVE) offered through PLS. AVEs are generated automatically using the bootstrap technique by the latest version of PLS-Graph. It can also be tested using the convergent validity measure developed by Fornell and Larckell (1981). Fornell and Larcker (1981) suggested that convergent validity is supported where AVE above 0.50 applies. Referring to Table 5.16, the lowest AVE is the external

factors construct, at 0.490, which indicates that only 49% of the variance of the indicators can be accounted for by the latent variables. AVE measures the variance captured by a latent construct, that is, the explained variance. For each specific construct, it shows the ratio of the sum of its measurement item variance as extracted by the construct relative to the measurement error attributed to its items.

Table 5.16: Convergent validity

Constructs	**AVE** **Fornell & Larcker, 1981**
External Factor	0.490
PEOU	0.617
PU	0.677
Usage	0.564
Satisfaction	0.766
Impact	0.688

The discriminant validity is measured by the square root of the AVE and here, values along the diagonal of the correlation matrix (square root of AVE for each construct) should be greater than the corresponding values in each row or column (Chin, 1998a). As demonstrated in Table 5.17, all the square root AVE were greater than the values in other constructs, thus confirming the existence of adequate discriminant validity at the construct level for all constructs included in this study.

Table 5.17: Discriminant validity

Constructs	Correlation of Constructs					
	External Factor	*PEOU*	*PU*	*Satisfaction*	*Usage*	*Impact*
External Factors	**0.700**					
PEOU	0.635	**0.785**				
PU	0.665	0.731	**0.823**			
Satisfaction	0.673	0.728	0.817	**0.875**		
Usage	0.646	0.715	0.759	0.817	**0.751**	
Impact	0.613	0.479	0.499	0.491	0.380	**0.829**

Therefore, the measurement model has been determined at both item and construct level (statistical validity and reliability). Next, it is appropriate to perform statistical testing upon each conceptual model or in PLS, as it is known, the structural model.

5.3 Summary of Regression Results

Before analysis of the PLS structural model, reported in the next chapter, regression analysis was also conducted and the results are shown in Table 5.18 below. The main reason for showing the regression results was to compare the results of regression with the PLS. The regression is seen as a traditional or first generation of multivariate analysis, whereas, the PLS as a second generation of multivariate analysis because it permits the simultaneous analysis of multiple criterion and predictor constructs.

Table 5.18: Results of regression

Independent variables	Dependent variables	R square	Beta Coefficient	Results
TMS	PU		0.417	Supported
ISS	PU	0.245	-0.097	Not Supported
Involvement	PU		0.219	Supported
Training	PEOU		0.096	Not Supported
Experience	PEOU	0.465	0.238	Supported
Internal expertise	PEOU		0.510	Supported
PEOU	PU	0.683	0.826	Supported
PU	Usage		0.505	Supported
PEOU	Usage	0.584	0.292	Not Supported
PU	Satisfaction		0.507	Supported
PEOU	Satisfaction	0.708	0.372	Supported
Satisfaction	Performance	0.196	0.443	Supported

The results above show that, although most relationships were supported, there are three relationships that were not supported by the regression. The three links are *ISS* to *PU*; *Training* to *PEOU* and *PEOU* to *Usage*. The results obtained by the regression will be compared with the results generated from the PLS. They will then be discussed further in Chapter Eight.

5.4 Summary of the Chapter

This chapter has outlined the process through which the measurement model was validated as part of the requirement in a PLS approach. To achieve this aim, an item loading threshold level of 0.70 was followed for the main four constructs in the study. The items in these four constructs are well established items and therefore, it is acceptable to apply a loading threshold of 0.70 or more to the items (Carmines and Zeller, 1979). However, items in the other related constructs followed the threshold level of 0.55 and above as suggested by Hair et al. (1987), a threshold commonly used by previous studies (e.g.: Hulland, 1999 and Ford et al. 1986).

The chapter also confirmed the appropriateness of the items and constructs used in this study by examining the individual item reliability, internal consistency and discriminant validity of the scale measures. These constructs will now be taken forward for a series of PLS modelling exercises for further statistical validation testing of the series of hypotheses in the following chapter.

CHAPTER SIX
Assessment of Structural Model

6.0 Introduction

After rigorous evaluation of reliability and validity of each construct of the measurement model has been performed in the previous chapter, this chapter continues with the requirements of the statistical approach by focusing on path analysis using PLS-Graph. Each path in the conceptual model is tested to determine whether it is statistically significant or not. This chapter starts with hypotheses related to the main conceptual model. It then continues with four additional sub-test models in this chapter and another four sub-test models in the appendices (Appendix 5) which were undertaken to compare with previously reported studies.

6.1 The Results of the Proposed Conceptual Model

The original Technology Acceptance Model (TAM) introduced by Davis (1986) was an adaptation of the Theory of Reasoned Action (TRA) as already explained in Chapter Two. The current study adapted the TAM to address the specific objectives of this study. In its adaptation of the TAM model, this study included user *satisfaction* and its *organisational impact* of using the AIS, while removing the attitude toward using and behavioural/intention to use constructs, as explained previously. Figure 6.1 presents the main conceptual model for this study. This is reproduced from Figure 2.11for the convenience of the reader.

The six external factors or inputs were chosen based on assessments of studies previously undertaken in IS or IT areas. Internal dynamic variables were based on the TAM model where the *usage* of the AIS is preceded by the perceived beliefs about the usefulness and ease of use of the systems. S*atisfaction* is identified as influenced by the actual *usage* of the system. At the same time, *satisfaction* with the system is also

influenced by the *PU* and *PEOU*. Finally, *satisfaction* with using the system is argued to be related to its *organisational impact*, which is the output of the model. In order to test the hypotheses, the t-values of the beta (β) path co-efficient were evaluated using a two-tailed test; where t-value greater than 2.58 is significant at the level of 0.01; a t-value which falls between 1.96 to 2.58 is significant at the level of 0.05; and a t-value between 1.65 to 1.96 is significant at the level of 0.10. Table 6.1 shows the summary of the tests performed in the study to obtain the results for the hypotheses developed in Chapter Two. These will be examined and discussed further in the pages which follow. The results related to the main proposed conceptual model are displayed in Figure 6.2.

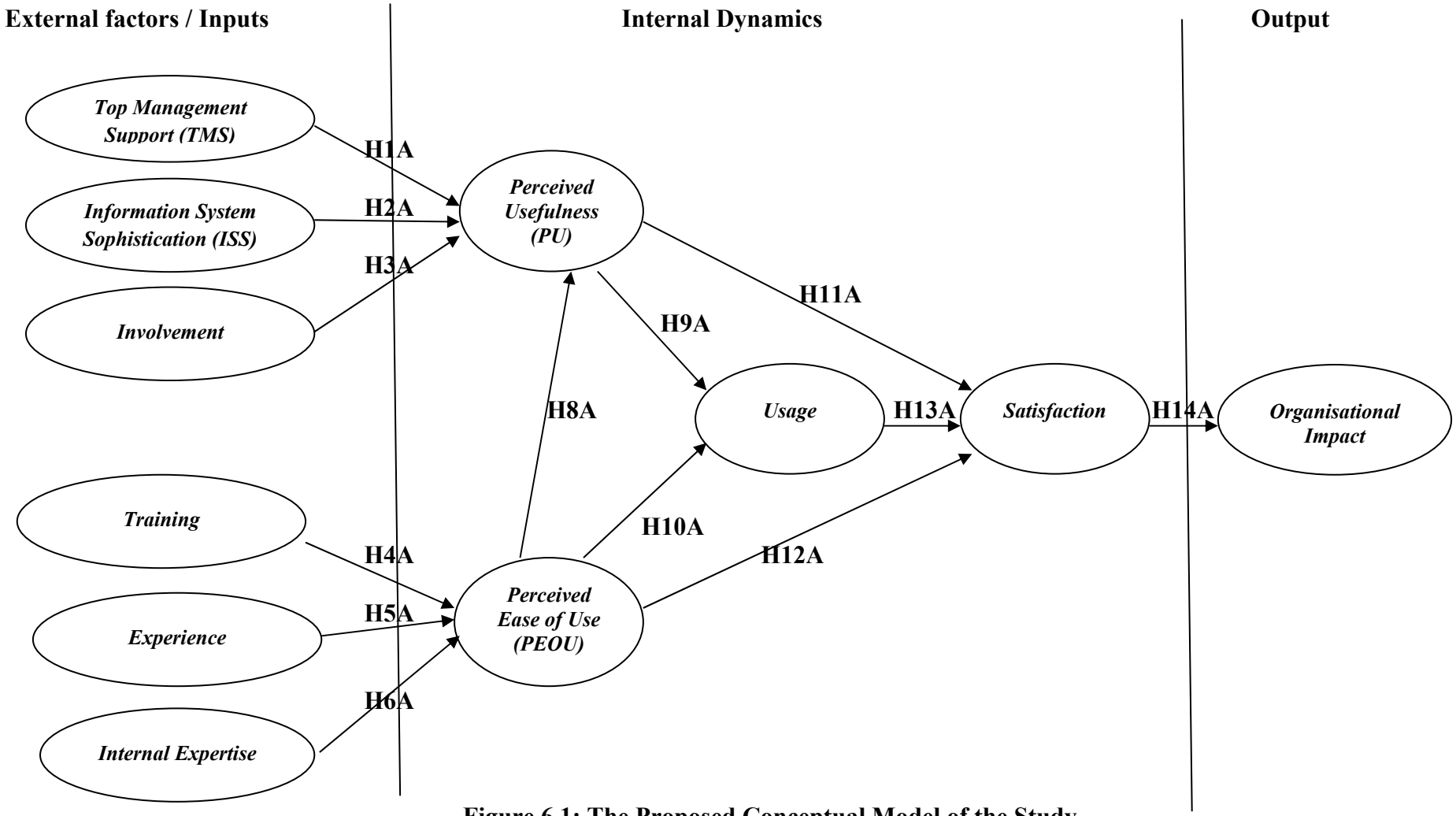


Figure 6.1: The Proposed Conceptual Model of the Study

	Conceptual Model in Chapter					Conceptual Model in Appendices			
The relationships	**Main**	**Sub-test 1**	**Sub-test 2**	**Sub-test 3**	**Sub-test 4**	**Sub-test A**	**Sub-test B**	**Sub-test C**	**Sub-test D**
TMS → PU	H1A	H1B	H1C	-	H1E	H1F	H1G	H1H	H1J
ISS → PU	H2A	H2B	H2C	H2D	H2E	-	H2G	H2H	H2J
Involvement → PU	H3A	H3B	H3C	H3D	H3E	H3F	-	H3H	H3J
Training → PEOU	H4A	H4B	H3C	H4D	-	H4F	H4G	H4H	H4J
Experience → PEOU	H5A	H5B	H5C	H5D	H5E	H5F	H5G	-	H5J
Internal Expertise → PEOU	H6A	H6B	H6C	H6D	H6E	H6F	H6G	H6H	-
PEOU → PU	H8A	H8B	-	H8D	H8E	H8F	H8G	H8H	H8J
PU → Usage	H9A	H9B	H9C	H9D	H9E	H9F	H9G	H9H	H9J
PEOU → Usage	H10A	H10B	H10C	H10D	H10E	H10F	H10G	H10H	H10J
PU → Satisfaction	H11A	H11B	H11C	H11D	H11E	H11F	H11G	H11H	H11J
PEOU → Satisfaction	H12A	H12B	H12C	H12D	H12E	H12F	H12G	H12H	H12J
Usage → Satisfaction	H13A	-	H13C	H13D	H13E	H13F	H12G	H13H	H13J
Satisfaction → Organisational impact	H14A	-	H14C	H14D	H14E	H14F	H14G	H14H	H14J
Satisfaction → Usage	-	13B	-	-	-	-	-	-	-
Usage→ Organisational impact	-	14B	-	-	-	-	-	-	-
PU → PEOU	-		H8C	-	-	-	-	-	-
TMS → PEOU	-	-	-	H1D	-	-	-	-	-
Training → PU	-	-	-	-	H4E	-	-	-	-
ISS → PEOU	-	-	-	-	-	H2F	-	-	-
Involvement → PEOU	-	-	-	-	-	-	H3G	-	-
Experience → PU	-	-	-	-	-	-	-	H5H	-
Internal Expertise → PU	-	-	-	-	-	-	-	-	H6J

Table 6.1: Summary of the tests of the study

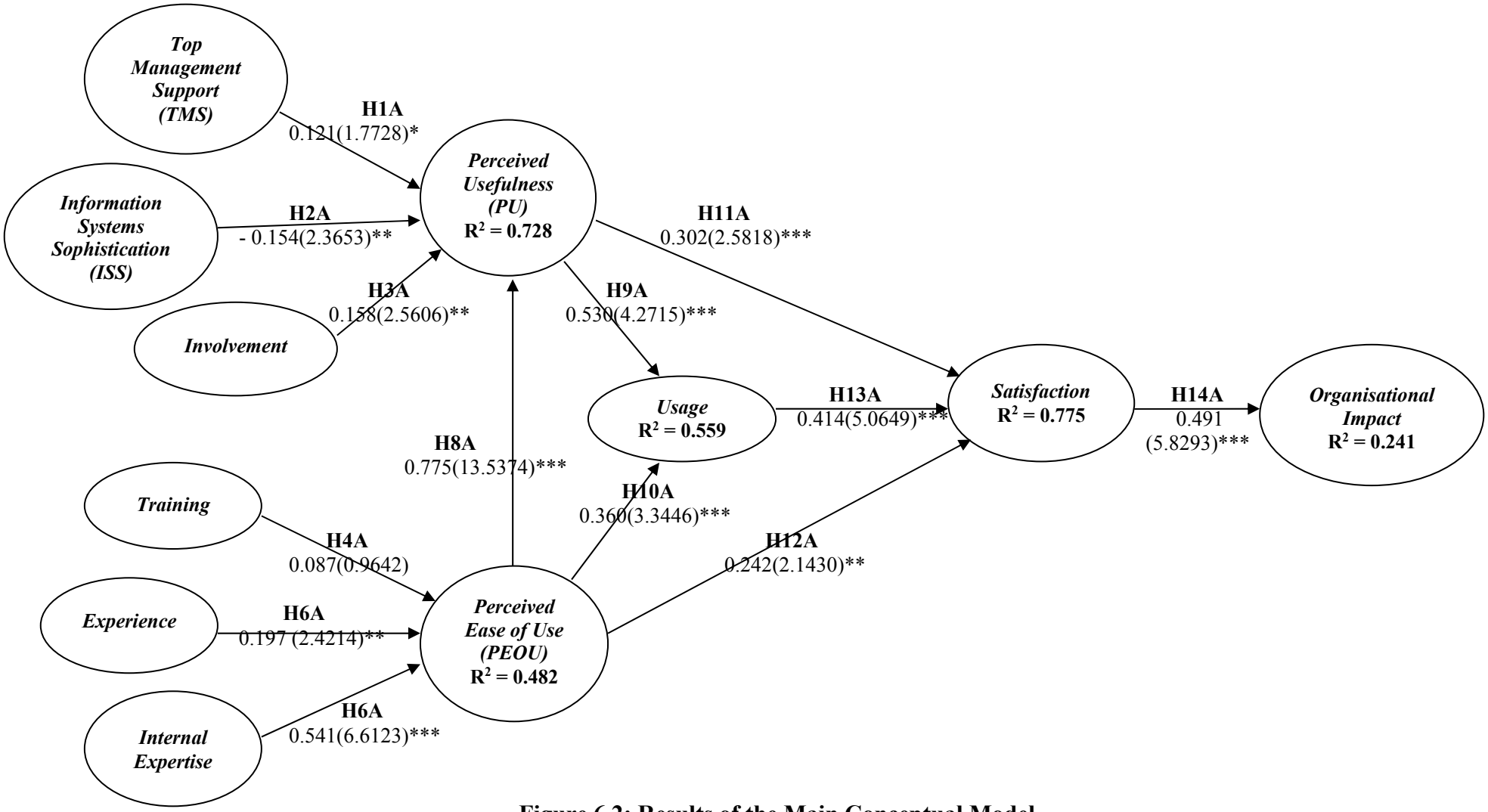


Figure 6.2: Results of the Main Conceptual Model

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.1

The results from the above Figure 6.3 show that the beta path co-efficient between the *TMS* construct and *PU* construct (H1A) is positive and statistically significant at the 0.10 level (β = 0.121; t = 1.7728). Lewis et al. (2003) found the same result where the institutional factor of top management commitment exhibited an expected positive influence on usefulness beliefs. Their beta path co-efficient between top management commitment and *PU* was 0.193 and significance at the 0.05 level. Rouibah et al. (2009) also found support for the relationship between *TMS* and *PU* at the 0.05 level.

In terms of information systems sophistication, the beta path co-efficient linking this construct with *PU* (H2A) is negative but statistically significant at p-value < 0.05 (β = -0.154; t = 2.3653). The next construct of *involvement* shows a positive and statistically significant relation with *PU* (H3A) at the 0.05 level (β = 0.158; t = 2.5606). This result is in line with the study by Rouibah et al. (2009) when they found user *involvement* has a direct effect on *PU* at the 0.05 level.

The co-efficient originating from *training* is positive but statistically insignificant to the *PEOU* (4A) (β = 0.087; t = 0.9642). This result is in contrast with previous research which reported *training* to directly affect *PU* (Rouibah et al., 2009). However, an earlier study by Agarwal and Prasad (1999) also reported *training* not to influence *ease of use* in their study about 'individual differences' in the acceptance of new IT.

The result also shows a positive and a significant relationship between *experience* and *PEOU* (H5A) at p-value <0.05 (β = 0.197; t = 2.4214). This result supports a study of Liaw and Huang (2003) where *experience* in using operating systems had a positive significant effect on *PEOU* at the 0.05 level. Agarwal and Prasad (1999) also reported the same result, a direct effect of *experience* on *ease of use*. However, earlier studies by

Davis et al. (1989) and Szajna (1996) have found different results, showing that *ease of use* is not significantly related to increased *experience*.

The relationship between the *internal expertise* construct and *PEOU* (H6A) is strong with a positive and statistically significant relationship at the0.01 level ($\beta = 0.541$; $t = 6.6123$). The path between the *PEOU* construct and *PU* construct (H8A) also shows a very strong result with a positive and statistically significant p-value < 0.01 ($\beta = 0.775$; $t = 13.5374$). Consistent with previous studies, Davis et al. (1989) also reported strong support for the influence of *ease of use* on *usefulness* at the 0.01 level. Igbaria et al. (1995) demonstrated the same finding when *PEOU* had a strong direct effect on *PU* at p-value < 0.001. In a further study, *ease of use* was also found to significantly affect *usefulness* at p-value < 0.001 with R^2 of 0.39 which indicated that *ease of use* alone explained 39% of variance in *usefulness* (Gefen and Straub, 2000). A later study by Selim (2003) also found a strong direct path between *ease of use* and *usefulness* with beta of 0.78 and a significant p-value < 0.0001. The results of a majority of other studies also strongly supported the path between *PEOU* and *PU* (eg.,Kim et al., 2008; El-Gayar and Moran, 2007; Wu and Wang, 2005; Liaw and Huang, 2003; Thong et al., 2002; Rouibah et al., 2000; Venkatesh and Davis, 2000; Gefan and Keil, 1998). However, not all studies were supportive; the Rouibah et al. (2009) study in Kuwait reported a non-significant relationship between *ease of use* and *usefulness.* Yi and Hwang (2003) also found an insignificant relationship between *ease of use* and *usefulness*.

Both of the beta path co-efficients originating from the *PU* construct are positive and statistically significant at the 0.01 level with the results as follows: *usage* (H9A) ($\beta = 0.530$; $t = 4.2715$) and *satisfaction* (H11A) ($\beta = 0.302$; $t = 2.5818$). Rouibah (2008) demonstrated it differently when his study found no significant relationship between *PU*

and *usage*. However, a year later, Rouibah et al. (2009) reported a significant relationship between *PU* and *usage*; and *PU* and *satisfaction*, both at the 0.05 level of confidence. Chiu et al. (2009) also found a strong relationship at 0.001 level between *PU* and *satisfaction* about intentions toward online shopping.

The results also indicate a positive and statistically significant relationship for both beta path co-efficients originating from *PEOU* to *usage* (H10A) at the 0.01 level ($\beta = 0.360$; $t = 3.3446$) and to *satisfaction* (H12A) at the 0.05 level ($\beta = 0.242$; $t = 2.1430$). With regard to the relationship between *ease of use* and *satisfaction*, a study by Rai et al. (2002) reported the same results; they found that *ease of use* influenced *satisfaction* and the result was significant at the 0.01 level. Rouibah (2008) also found that *PEOU* exerted a strong total effect, both directly and indirectly through perceived enjoyment, on *usage* at the 0.05 level. However, an insignificant relationship was found between *ease of use* and *usage* by Rouibah et al. (2009).

In terms of the *usage* construct linking to the *satisfaction* construct (H13A); this also resulted in a strong positive relationship which was statistically significant at the 0.01 level ($\beta = 0.414$; $t = 5.0649$). Wang and Liao (2008) also found the same result between *use* and *satisfaction,* as their study resulted in a significant relationship at the 0.01 level of significance. The study by Livari (2005) showed slight support for the link between *usage* and *satisfaction* when he reported a result significant at the 0.10 level. Al-Gahtani (2004) also found support for this link. Rouibah et al. (2009) found a significant effect of *usage* on *satisfaction* at the 0.05 level. The work of Baroudi et al. (1986) was also strongly supported, since they reported that user *satisfaction* and system *usage* are positively correlated. However, Hunton and Flowers (1997) came out with insignificant relationships from IS *use* to user *satisfaction*.

As for *satisfaction*, it yielded a positive and statistically significant beta path coefficient with the *organisational impact* construct (H14A) at p-value <0.01 (β = 0.491; t = 5.8293). A summary of the results for the proposed conceptual model is presented in Table 6.2.

Table 6.2: Summary of the results for the proposed main conceptual model

Support/Rejection of Conceptual Model Hypotheses						
Constructs	Hypothesis	Beta Value	T-value	Sig.	Sig. Level	Outcome
TMS → PU	H1A	0.121	1.7728	Yes	0.10	Support
ISS → PU	H2A	-0.154	2.3653	Yes	0.05	Support
Involvement → PU	H3A	0.158	2.5606	Yes	0.05	Support
Training → PEOU	H4A	0.087	0.9642	No	-	Reject
Experience → PEOU	H5A	0.197	2.4214	Yes	0.05	Support
Internal Expertise→ PEOU	H6A	0.541	6.6123	Yes	0.01	Support
PEOU → PU	H8A	0.775	13.5374	Yes	0.01	Support
PU → Usage	H9A	0.530	4.2715	Yes	0.01	Support
PEOU → Usage	H10A	0.360	3.3446	Yes	0.01	Support
PU → Satisfaction	H11A	0.302	2.5818	Yes	0.01	Support
PEOU → Satisfaction	H12A	0.242	2.1430	Yes	0.05	Support
Usage → Satisfaction	H13A	0.414	5.0649	Yes	0.01	Support
Satisfaction → Organisational impact	H14A	0.491	5.8293	Yes	0.01	Support

According to Hulland (1999), the primary objective of PLS is the minimization of error (or, equivalently, the maximization of variance explained) in all endogenous constructs. The degree to which any particular PLS model accomplishes this objective can be determined by examining the R^2 values for the dependent (endogenous) constructs. These figures help to explain how much of the variance in the dependent variables is explained by the model (Pallant, 2010) which is similar to the role played by the R^2 in multivariate analysis.

From the results of the conceptual model presented in Figure 6.2, the following R^2 values were generated: *PU* (72.8%); *PEOU* (48.2%); *usage* (55.9%), *satisfaction* (77.5%); and *organisational impact* (24.1%). Thus, for example, the R^2 value for the

PU is 0.728, which means that the conceptual model explains 72.8% of the variance in this construct. It is now possible to summarize whether the hypotheses outlined for the proposed model have been supported or rejected based upon the results obtained in the conceptual model (Figure 6.2). As shown in Table 6.2, twelve hypotheses have been supported and only one was rejected. The practical implications of these results will be discussed later, in Chapter Eight.

A primary objective of the proposed conceptual model was to situate the *satisfaction* and *organisational impact* of using accounting information systems (AIS) within a well-established theoretical and empirical TAM (Davis et al., 1989). The results are encouraging as *satisfaction* and *organisational impact* related hypotheses were both supported. With regard to the external variables chosen in the study, only one is rejected.

In spite of the strong support for the conceptual model, it was appropriate to conduct additional robustness statistical testing to determine whether factors affecting one variable can also be affecting other variables as this may influence the *use* and *satisfaction* of the AIS in Malaysia. It should be noted that the majority of previous studies looked at other IT or IS contexts, whereas, this current study focuses on accounting information systems (AIS) only. The rationale for these additional tests is that they are needed to address how other external variables may relate to *PU*, *PEOU* and other constructs in the model (Davis, 1989), in terms of AIS in a Malaysian context.

6.2 The Conceptual Model: Sub-Test 1 (Satisfaction to Usage& Usage to Impact)

This sub-test 1 refers to the IS success model by DeLone and McLean (1992 & 2003) which has received wide attention from researchers (Eg., Rai et al., 2002; Seddon, 1997;

Seddon and Kiew, 1994; Goodhue and Thompson, 1995). The DeLone and McLean model proposed that user satisfaction could influence intention to use a system. This current study is interested to test the link between *satisfaction* and *usage* based on the model proposed by DeLone and McLean.

In the main proposed conceptual model of this current study, usage was linked with satisfaction and it was shown that usage was a highly influential determinant of satisfaction with AIS in the hotel industry in Malaysia. This is demonstrated in the summary results below (Table 6.3).

Table 6.3: Summary of results for *Usage → Satisfaction*

Main Conceptual model	Beta value	T-value	Sig.	Sig. Level
Main model (H13A)	0.414	5.0649	Yes	0.01

We now focus on the direction of the relationship between *satisfaction* and *usage* (H13B). In this sub-test 1, a change of direction is postulated by exploring the *satisfaction* construct and its link with the *usage* construct. The results are presented in Figure 6.3. The outcome of postulating a new direction between *satisfaction* and *usage* is interesting; the beta path co-efficient between *satisfaction* construct and *usage* construct shows a strong relationship at p-value < 0.01 ($\beta = 0.586$; $t = 4.4568$).

This strong relationship between *satisfaction* and *usage* was supported by previous studies. A study by Livari (2005) also confirmed the same finding, which was significant at the 0.10 level. Wu and Wang (2006) were also in an agreement with the result when they reported support for the link between *satisfaction* and *usage* at the 0.05 level. McGill et al. (2003) generated a similar finding when they replicated the DeLone and McLean model to test their hypotheses. They strongly supported the link between *satisfaction* and *usage* at p-value < 0.01. Chen and Cheng (2009) also replicated the

DeLone and McLean model and found a significant relationship between *satisfaction* and *usage* in online shopping.

However, the new direction has an impact on both paths of *PU* (H9B) and *PEOU* (H10B) linking to *usage*. The impact of *PU* on *usage* (H9B) is found to have a positive but statistically not significant (β = 230; t = 1.5278) relationship. Previous studies reported mixed results on this issue. The result in this current study is in line with Brown (2002), who concluded that *PU* did not predict *usage* (β = 0.04; p-value = 0.734). However, Gefan and Keil (1998) in an earlier study showed a strong support between *usefulness* and *usage*, significant at the 0.01 level.

In this sub-test also, *PEOU* does not have a significant relationship to *usage* (H10B) (β = 0.059; t = 0.4416). This result is in contrast with the study by Brown (2002), who found that *ease of use* did impact *usage*, significant at p-value < 0.05. All other hypotheses in this model remain the same as previously disclosed.

This sub-test 1 resulted in strong support for the *usage* construct in relation to the *organisational impact* construct (H14B), positive and statistically significant at the 0.01 level (β = 0.389; t = 4.1141) which is similar to H14A between the *satisfaction* construct and *organisational impact* construct as shown in Table 6.4 below.

Table 6.4: Summary of results for *Satisfaction→ Organisational Impact*

Main Conceptual model	Beta value	T-value	Sig.	Sig. Level
Main model (H12A)	0.491	5.8293	Yes	0.01

The R^2 values are similar to results generated in the main model with *PU* of 72.8%, *PEOU* of 48.2% and *satisfaction* of 70.8%. However, R^2 value for *usage* increased from 55.9% in the previous test to 69.6%, whereas, R^2 value for *organisational impact* from

usage was reduced to 15.1% compared to 24.1% from *satisfaction* to *organisational impact*. To conclude, this sub-test 1 resulted in a less satisfactory outcome than the main conceptual model tested previously. Further discussion about the practical implications of this sub-test 1 will occur in Chapter Eight.

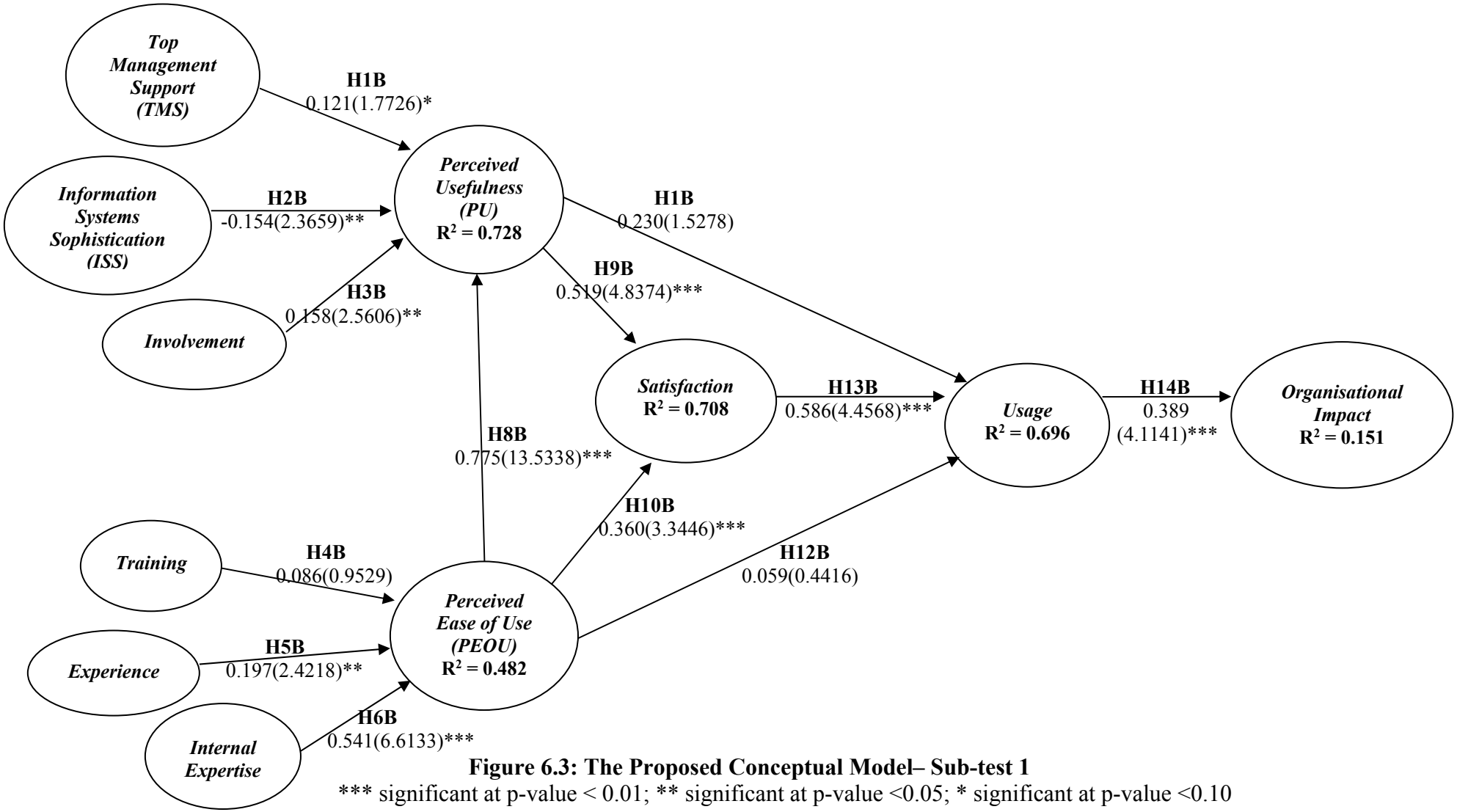


Figure 6.3: The Proposed Conceptual Model– Sub-test 1

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

6.2.1 Internal Dynamics - Indirect Effects

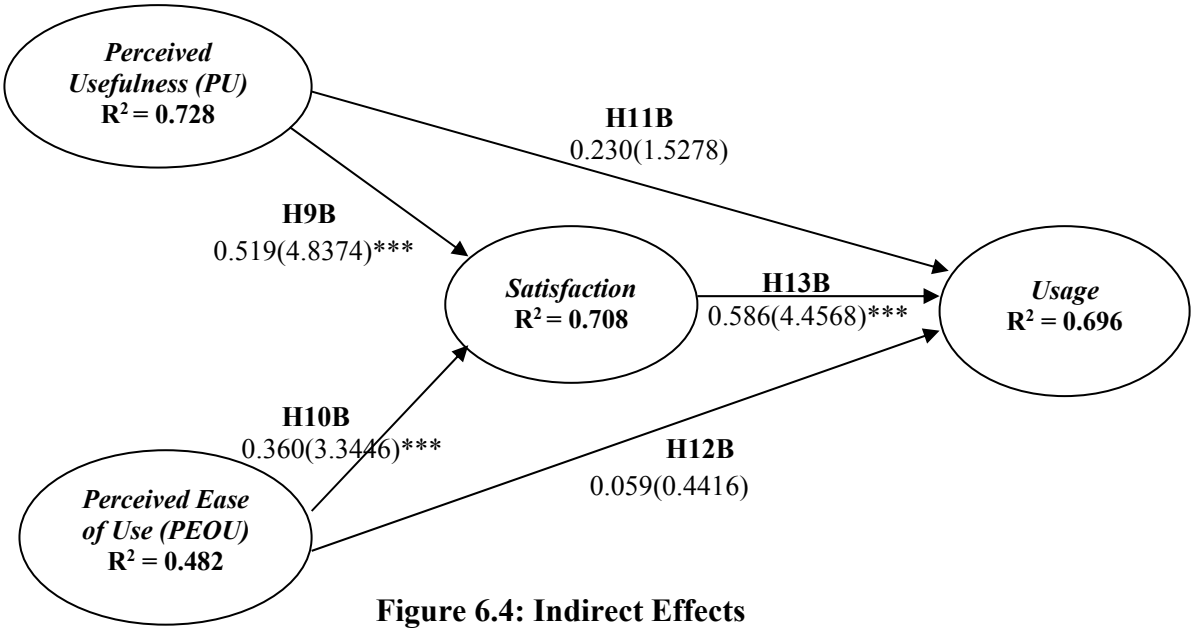


Figure 6.4: Indirect Effects

With reference to the conceptual model sub-test 1 in Figure 6.3, the above part of the model (Figure 6.4) is extracted (from Figure 6.3) in order to examine more closely the indirect effects of *PU* and *PEOU* on *usage* through *satisfaction*. The DeLone and Mclean models (1992 and 2003) were referred to when the sub-test 1 was conducted. According to the DeLone and Mclean models, an individual's attitude and subsequent behaviour are preceded by his or her beliefs about the quality of the IS. Behaviour (actual use) is influenced by attitude (*satisfaction*); an individual's attitude is formed through actual use (Chen and Cheng, 2009).

With the above assumption, the results in Figure 6.4 above show that *PU* of AIS has no direct influence over the *usage* of AIS. However, *PU* affects *usage* if the user is satisfied with the AIS in the first place. The same situation happens with *PEOU,* which shows that it does not directly impact *usage,* with a significant relationship, but if the user is satisfied with the AIS currently used, *PEOU* may affect the *usage* of AIS.

Table 6.5: Direct and indirect effects of selected variables

Variable	Linkage	Path	Direct effect	Indirect effect	Hypothesis	
PU		SAT	0.519***(4.8374)		H10B	Supported
SAT		USE	0.586***(4.4568)		H12B	Supported
PU		USE	0.230(1.5278)		H8B	Not supported
PU	SAT	USE		0.305***(3.3130)		Supported
PEOU		SAT	0.360***(3.3446)		H11B	Supported
SAT		USE	0.586***(4.4568)		H12B	Supported
PEOU		USE	0.059(0.4416)		H9B	Not supported
PEOU	SAT	USE		0.219***(2.7318)		Supported

SAT = Satisfaction; USE = Usage

Table 6.5 above shows that both *PU* and *PEOU* have an indirect significant influence on *usage* through *satisfaction*. The co-efficients of the indirect effects are 0.305 (t-value = 3.3130) and 0.2196 (t-value = 2.7318) respectively and both are significant at the 0.01 level. This indicates that even though both *PU* and *PEOU* do not influence *usage* directly, both strongly have an indirect effect through *satisfaction*.

6.3 The Conceptual Model: Sub-Test 2 (PU to PEOU)

In the main model and in sub-test 1, *PEOU* was directed to link with *PU*. The results as summarized in Table 6.6 show that *ease of use* is a very good determinant of *usefulness*. Both interactions in the main model and the sub-test 1 resulted in a significant relationship at $p < 0.01$ or better.

Table 6.6: Summary of results for
Perceived Ease of Use → Perceived Usefulness

Main Conceptual model	Beta value	T-value	Sig.	Sig. Level
Main model (H8A)	0.775	13.5374	Yes	0.01
Sub-test 1 (H8B)	0.775	13.5338	Yes	0.01

In this sub-test 2, the effect of changing the direction from that previously tested is examined, where the direction of the path from *PEOU* to *PU* is reversed. The rest of the paths remain the same as in the main proposed conceptual model. The results are presented in Figure 6.5.

Interestingly, the results show that *PU* is a strong predictor of *PEOU* (H8C) at the 0.01 level with beta path co-efficient of 0.708 and t-value of 10.1911. In addition, the path from *TMS* is also surprisingly increased when related to *PU* from the 0.10 level in the main proposed model tested (H1A) to the 0.01 level in this sub-test 2 (H2C). However, *ISS* has changed to have a statistically insignificant to link with *PU* (H2C). Previously, this link resulted in a negative but statistically significant relationship at the 0.05 level (H2A).

The link from *training* to *PEOU* resulted in a negative and not significant relationship in this current test (H4C), compared to a positive and not significant relationship in the model previously tested (H4A), whereas, the path originating from *experience* to *PEOU* also changed from previously significant at 0.05 level (H5A) to statistically insignificant in this test (H5C). The relationship of *internal expertise* to *PEOU* (H6C) remained the same as before (H6A), significant at the 0.01 level. All other results remained similar to those in the main proposed conceptual model.

Additionally in this test, the R^2 value for *PU* decreased considerably from 72.8% in the main model to only 27.6% in this current test. This demonstrates the importance of the *PEOU* construct and its contribution to the variance of *PU*. However, the results also show the importance of the *PU* construct in determining the variance in the *PEOU* construct, as the R^2 value of *PEOU* increased from 48.2% in the main model to 72.3% in the current test. The rest of the R^2 values for *usage*, *satisfaction* and *organisational impact* were all similar to the main model tested earlier, as would be expected.

Hence, it is concluded that overall this sub-test 2 does not improve the main proposed conceptual model. The path from *PEOU* to *PU* (as in the main model) resulted in a better overall explanation of relationships in the model.

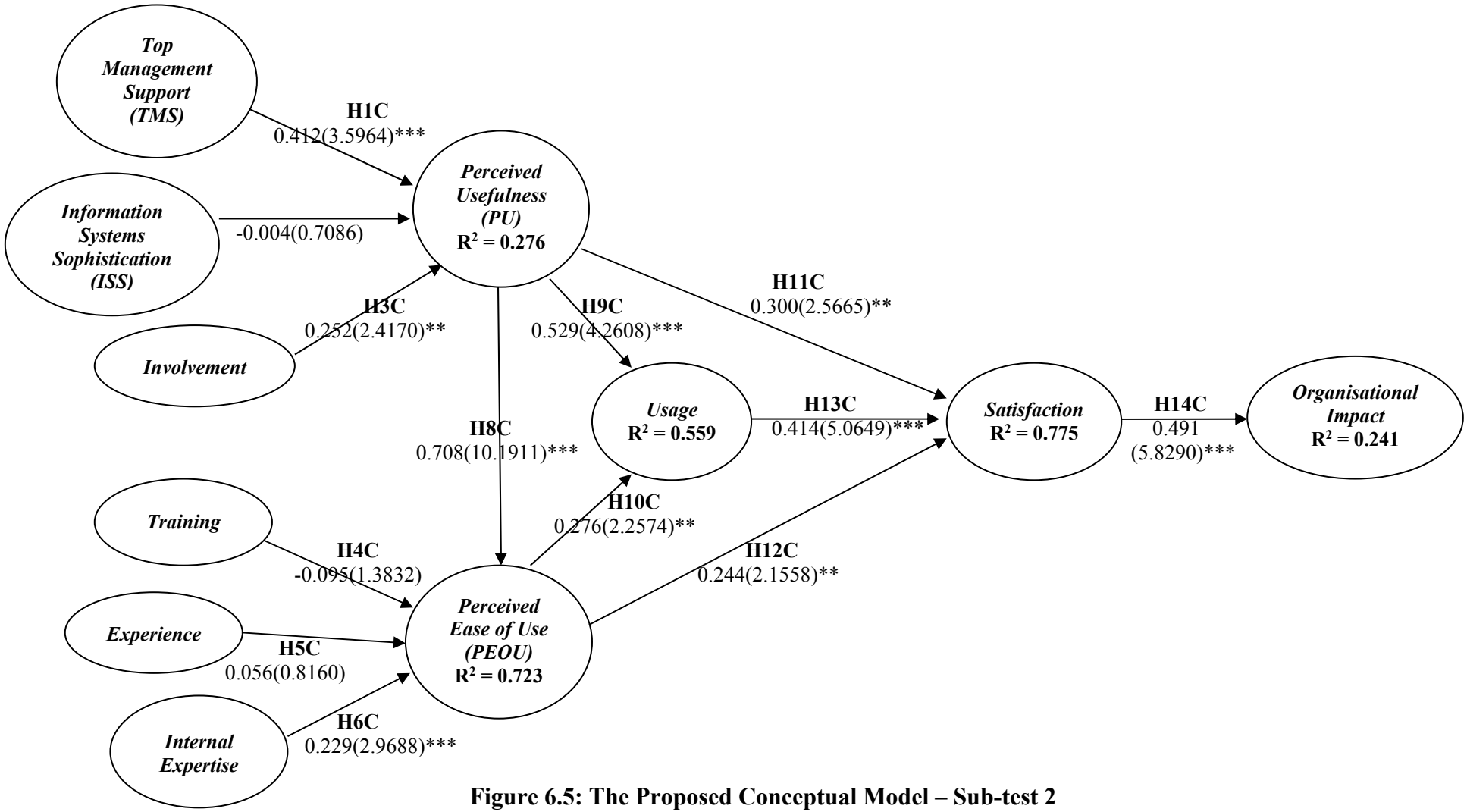


Figure 6.5: The Proposed Conceptual Model – Sub-test 2

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

6.4 The Conceptual Model: Sub-test 3 (TMS to PEOU)

In all previous attempts (H1A, H1B & H1C), *TMS* was associated with *PU* and resulted in positive and statistically significant relationships at the 0.10 level in H1A and H1B; and at the 0.01 level in H1C (Table 6.7). This sub-test 3 is to test the effect of changing the situation of *TMS* to link with *PEOU* (H1D). The results of this test are presented in Figure 6.6.

Table 6.7: Summary of results for
Top Management Support → Perceived Usefulness

Main Conceptual model	Beta value	T-value	Sig.	Sig. Level
Main model (H1A)	0.121	1.7728	Yes	0.10
Sub-test 1 (H1B)	0.121	1.7726	Yes	0.10
Sub-test 2 (H1C)	0.412	3.5964	Yes	0.01

When linked to *PU* (H1A), *TMS* showed a positive and slightly significant relationship at the 0.10 level. However, it showed a positive but not significant result when linked to *PEOU* (H1D). Lewis et al. (2003) found an unexpected and surprising result when they discovered a significant relationship between top management commitment and *ease of use.* With co-efficient of 0.232 and significant at the0.05 level, they argued that this significant relationship arises from the individual's assessment of the resource allocation implications of top management commitment and support. Such support might help overcome obstacles in learning to use the technology through the availability of assistance, etc. (Lewis et al., 2003).

The change of the hypothesised relationship of *TMS* to *PEOU* also affected the relationships between *ISS* and *PU,* as it generated only a slight positive relationship at the 0.10 level (H2D) compared to previous support at the 0.05 level (H2A). However, the relationship of *involvement* to *PU* increased from the 0.05 significance level in the main model (H3A) to the 0.01 significance level in the current model (H3D). The path

from *PEOU* to *usage* also shows a slight decrease from the 0.01 level (H10A) to the 0.05 level (H10D) in this sub-test 3. Apart from those changes, all other results were similar to those of the main model.

In terms of R^2 values, this model produced results which were very similar to the R^2 values in main model, which are as follows: *PU* (72%); *PEOU* (48.4%); *usage* (55.9%), *satisfaction* (77.5%); and *organisational impact* (24.1%). This sub-test 3, therefore, has only a limited impact on our interpretation of the overall findings.

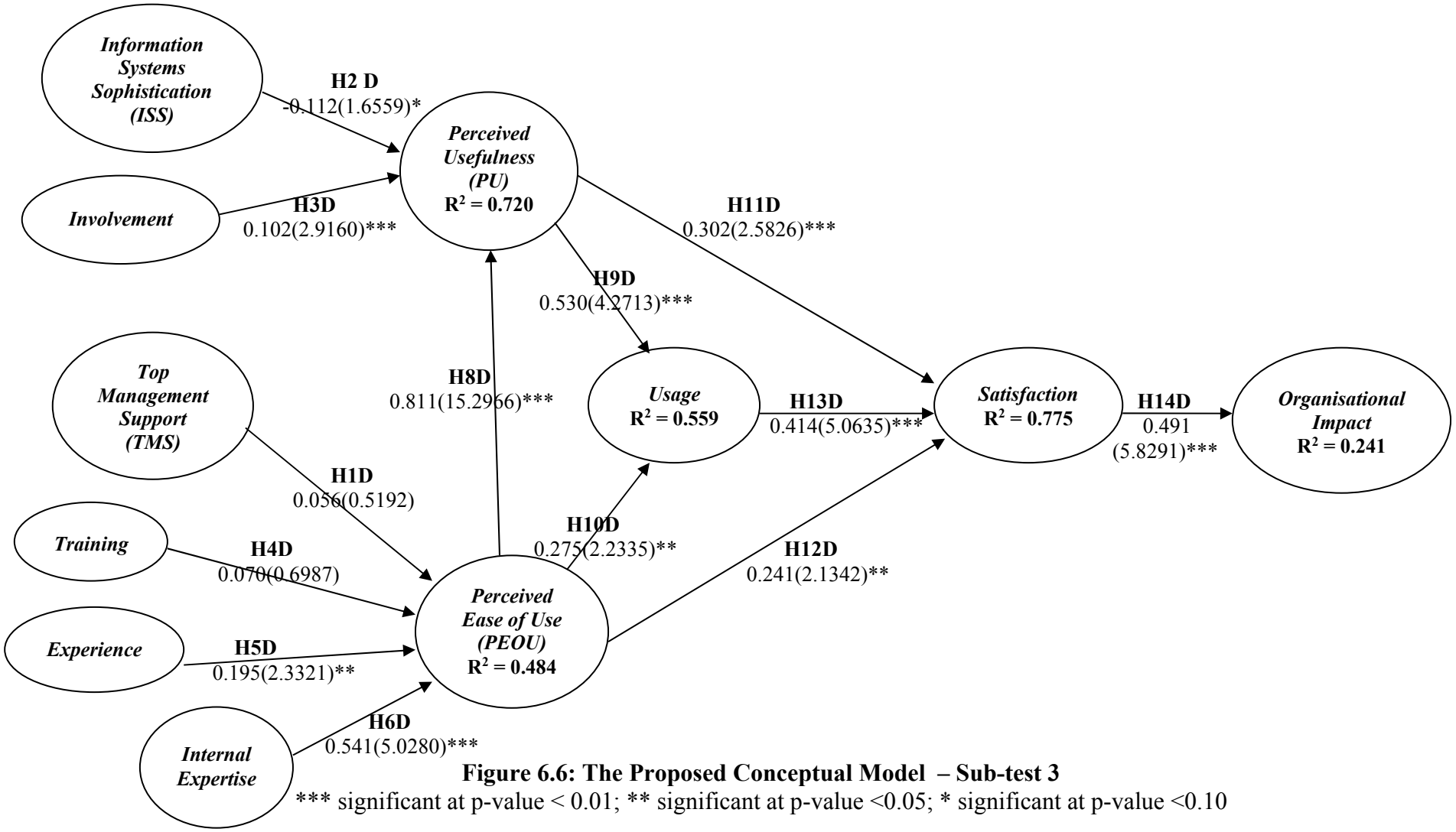


Figure 6.6: The Proposed Conceptual Model – Sub-test 3

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

6.5 The Conceptual Model: Sub-Test 4 (Training to PU)

The results of linking the *training* construct to the *PEOU* construct were found to be insignificant in all the previous attempts, as presented in Table 6.8. It was decided to repeat the test by linking the *training* construct to the *PU* construct (H4E). Figure 6.7 displays the results of the test.

Table 6.8: Summary of results for *Training → Perceived Ease of Use*

Main Conceptual model	Beta value	T-value	Sig.	Sig. Level
Main model (H4A)	0.087	0.9642	No	-
Sub-test 1(H4B)	0.086	0.9529	No	-
Sub-test 2 (H4C)	-0.095	1.3832	No	-
Sub-test 3 (H4D)	0.070	0.6987	No	-

In the main proposed conceptual model (Figure 6.2), the impact of *training* on *PEOU* (H4A) was not significant. In this current test it was very encouraging to find that when *training* was linked to *PU* (H4E), it was found to strongly influence the relationship at the 0.01 level. This result is supported by an earlier study about the acceptance of new IT from Agarwal and Prasad (1999), when they found a direct effect of *training* on *usefulness* at the 0.05 level.

Other results obtained from this test were in relation to *TMS* which showed a change from a slight significant relationship to *PU* (H1A), at 0.10 level, to a totally insignificant impact on *PU* (H1E). However, information systems sophistication increased in its influence on *PU* from the 0.05 level (H2A) to the 0.01 level in this test (H2E). The remainder of the hypotheses in sub-test 4 are not different from the results obtained in the main model.

The R^2 value for *PU* increased from 0.728 in the main model to 0.771 in this current test. The R^2 value for *PEOU* resulted in little change, decreasing from 0.482 in the main

model to 0.477 in this sub-test 4. All other R^2 values, as expected, were identical to those generated previously.

This sub-test 4 resulted in a positive and significant relationship between *training* and *PU*. This implies that *training* may be best situated linked with *PU* instead of *PEOU*. The practical implications of these relationships will be discussed further in Chapter Eight.

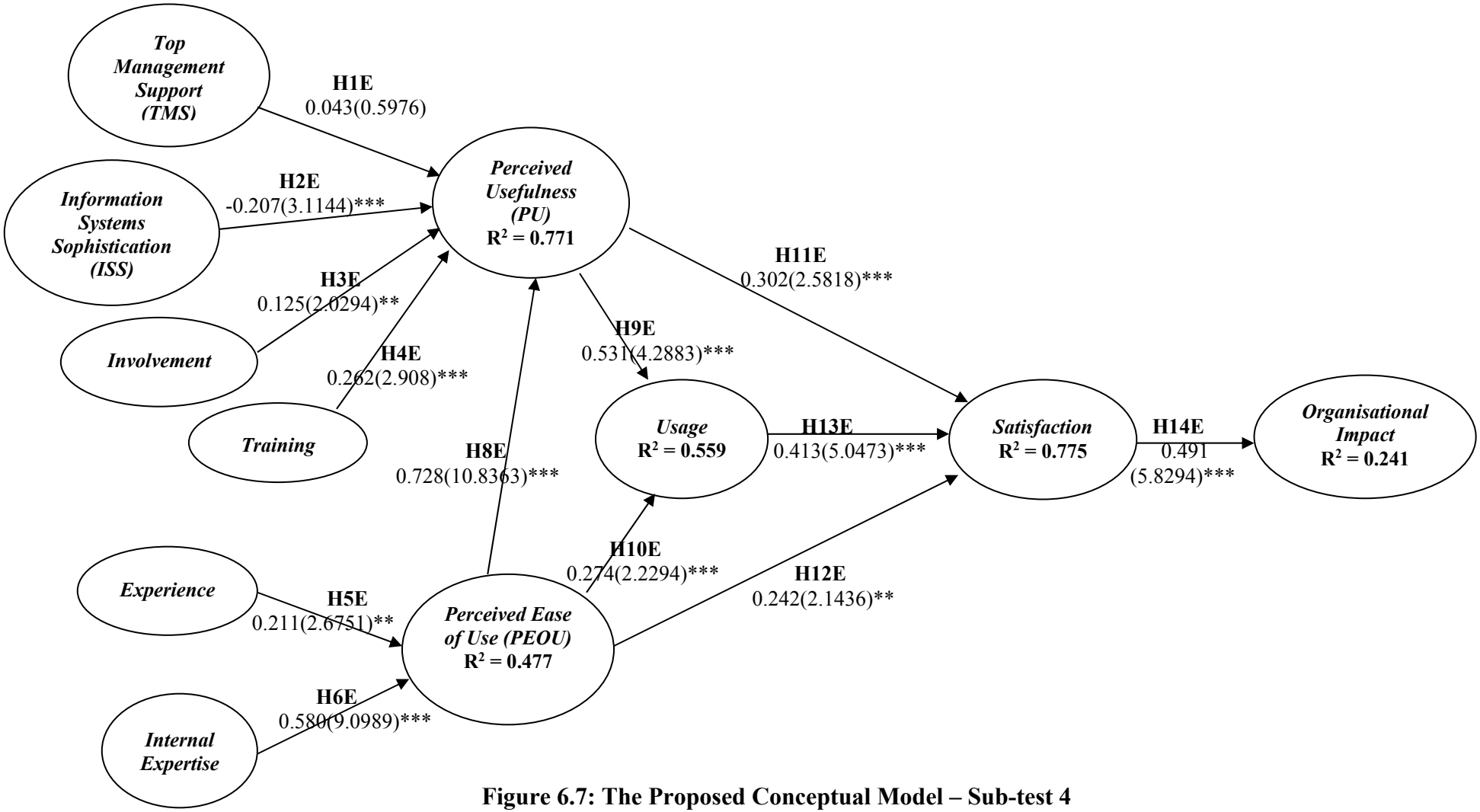


Figure 6.7: The Proposed Conceptual Model – Sub-test 4

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

6.6 Summary of the Chapter

The objective of the conceptual model in this study was to situate the *satisfaction* and *organisational impact* of AIS within the theoretical and empirical TAM (Davis, 1989); also to identify the external factors that affect the *PU* and *PEOU* of AIS and whether these can impact *satisfaction*, *usage* and *organisational impact*.

The findings have supported all the three external factors that link with *PU*. Notably, *ISS* is significant with a negative direction.*TMS* only generated a slightly positive influence over *usefulness*; and only *involvement* resulted in a strong and positive impact over *usefulness*. The three paths of external factors linked to *PEOU* also showed mixed results, with *experience* and *internal expertise* both displaying a statistically significant relationship to *ease of use*, whilst *training* was found not to influence the *PEOU* of the AIS in this industry.

As shown by previous studies in other areas of information systems, *usage* significantly impacts upon *satisfaction* (the main model) of using AIS. The same applies to *satisfaction* impacting upon *usage*, that is, when the direction is changed (sub-test 1). In the main model, *satisfaction* very strongly and significantly influences *organisational impact*. *Usage* is also found to affect *organisational impact* with a strong positive result (sub-test 1).

The findings on *PU* and *PEOU* strongly support the original work of Davis et al.(1989). This current study found that *PEOU* had a significantly strong impact on *PU*. The results also show that *PU* and *PEOU* had a positive and statistically significant impact upon *satisfaction* and *usage*. These results occurred when *usage* was situated to link with *satisfaction*. However, the results were totally different when the direction was

reversed, that is, when *satisfaction* was placed to link with *usage* (sub-test 2). In this case, it was found that *usefulness* and *ease of use* did not significantly affect *usage*.

When *TMS* was applied to link with *PEOU* in sub test 3, the outcome was not the same as previously tested (against *PU*), and therefore this approach is rejected. The outcome suggests that *TMS* only has a slight influence over the *PU* but none on *PEOU* in this study. When *training* was applied to link with *PU* (sub-test 4), it is surprising that it resulted in a strong impact upon *usefulness*, compared to when *training* was linked with *ease of use*, when it was rejected. This illustrates that *training* is only impacting upon *PU* but not *PEOU* of using AIS in the context of the hotel industry in Malaysia (note that the interviews which follow develop these insights on measuring *training* in the study).

Another four robustness statistical tests are shown in Appendix 5. In these tests the directions of *ISS* (sub-test A) and *involvement* (sub-test B) were changed to link with *ease of use*. This resulted in rejection of both hypotheses and thus, neither is important to *ease of use*. In sub-test C, *experience* was situated to link with *PU* and the result also rejected the hypothesis. Even though *experience* is shown to impact strongly upon *PEOU*, it does not impact upon *PU* in this study. Finally, the sub-test D situated *internal expertise* to link with *usefulness* and as shown in Appendix 5-4, it resulted in a non-significant influence and hence was rejected.

This current study (the main model) looked at the TAM model's perspective when *PU* and *PEOU* were situated to link with *usage*. However, when consideration was given to *PU* and *PEOU* linking directly to the *satisfaction* construct (sub-test 1), the results were interesting. Both *PU* and *PEOU* also were shown to very strongly and significantly

influence *satisfaction*. These results confirmed that *satisfaction* is also a function of the two beliefs of *PU* and *PEOU*.

Finally, this study found indirect support for the *usage* of AIS through the *satisfaction* of those using it. Thus we conclude that if the user believes that the AIS is useful and is easy to use, and at the same time they are also satisfied with it, the *usage* of AIS becomes major in their work place, they perform well and to a high level of *satisfaction*, and this leads to a higher performance of the organisation as a whole.

CHAPTER SEVEN
Interviews

7.0 Introduction

A number of survey respondents agreed to participate in further interviews to expand the research insights. Information from the interviews would be an important source of triangulation and confirmation of the results of the survey. It is hoped that this qualitative data will provide richer and deeper understanding about the topic under research. Six hotels were selected from the questionnaire-responding companies, those indicating willingness to participate in the further interviews.

The nature of the case studies was explanatory using semi-structured interviews, which are more appropriate to the research and used more frequently (Saunders et al., 2009). These semi-structured interviews were carried out to explore and explain the factors influencing the acceptance of AIS, also to further understand the impact of *PU* and ease of use on *usage* and *satisfaction* with the AIS. Finally, they were used to discover the relationships between *usage* and *satisfaction* with the AIS and various hotel performance indicators. This information from qualitative data can be used to validate the findings from the survey.

Prior to the interviews, a list of themes and an interview protocol were developed based on the literature, research questions, hypotheses and questionnaire (see Appendix 3). All the interviews were with the senior executives in the accounts department. All interviews were tape recorded and transcribed. The transcript was sent to the interviewees for validity and confirmation. The names of the participants and their hotels are not revealed because the information provided is regarded as confidential. Table 7.1 gives the detail of each interview.

Table 7.1: Details of the interviews

Hotels	Main contact	Hotel star rating /Location
A	Accounting Executive	3 star / Kuala Lumpur
B	Accounting Manager	4 star / Kuantan, Pahang.
C	Accounting Manager	3 star / Kota Bharu, Kelantan.
D	Accounting Executive	5 star / Langkawi Island, Kedah.
E	Accounting Executive	3 star / Langkawi island, Kedah.
F	Accounting Executive	3 star / Kuala Terengganu, Terengganu.

This chapter starts with a brief description of each hotel. An interpretation of the outcome of the interviews to compare and contrast with the survey findings will then be performed. The findings from the survey and interviews will form the basis for discussion in the following chapter.

7.2 Background of the Case Hotels

Hotel A

This hotel is located in Kuala Lumpur, the capital city of Malaysia. It is a 3 star hotel that belongs to the state government. There are all together three hotels under the management of this state government. The other two hotels are also located in Kuala Lumpur and both are 4 star hotels. Hotel A is located 47 km away from Kuala Lumpur International Airport and offers affordable accommodation. The hotel is just 600 metres from Putra World Trade Centre, a few miles away from Petronas Twin Towers and just 2.5 km from popular shopping options. With 275 non-smoking and air-conditioned rooms, it promises undisturbed comfort from a range of room types. All guestrooms are fully furnished with all the essentials for a comfortable stay. The hotel houses a rooftop pool and a coffee house.

Currently there are 110 full time employees with 8 of them in the accounting department. In terms of AIS, they are using the IFCA accounting system for managing accounting matters and Easy Pay for salary. The IFCA replaced the previously used

Systems Applications and Products (SAP). The change was because the monthly costs that they needed to pay to the vendor for SAP were high. IFCA is cheaper and more affordable. However, the IFCA which is currently used is not as efficient as SAP. One of the reasons is because IFCA has no link between the front office and the back office. Therefore, it is necessary to manually transfer the figures from other departments to the back office. Another problem is that the IFCA was 100% copied from the IFCA that was customized for the needs of the other two 4 star hotels under the same ownership. Therefore, the system does not exactly satisfy all the needs of this hotel. Among the problems with IFCA is that it is inflexible; it does not allow any change to the figures which have been saved in the system. For example, if they need to revise the last year's budget, the staff need to do it all over again because the figures in the last year budget cannot be changed. The IFCA system also does not have the page numbers for any reports produced. It can be seen as a small problem but this has a negative impact on the users of the reports.

Hotel B

It is a 4 star resort hotel located close to a beach on the east coast of Peninsular Malaysia. There are a total of 90 full time employees and 10 of them are accounting staff. This resort belongs to the state government and receives support from government agencies that use the resort for courses, outdoor activities, meetings etc. Therefore, this resort is more dependent on government spending to survive, compared to local or international private guests. Normally 50% of the occupancy rates come from the government agencies.

It is located only 15 minutes' drive from Kuantan Town, and offers 162 rooms equipped with complete facilities. The resort hotel is set on 6 acres of lush landscaped

surroundings, fronting the ‘clear blue waters of the South China Sea’. With a beautiful scenic beach front, this resort offers one of Malaysia's largest freeform swimming pools, pristine golden sandy beaches; and claims ultra-modern facilities and charming hospitality.

In 2003 the resort decided to change from Acctrack accounting to Biztrak accounting which is currently used. Biztrak was developed by local people and so it was cheap to obtain. The accounting manager has good contact with the accounting firm which is also the vendor that supplies the system. It is easy to deal with the vendor who has an accounting background because the vendor knows what is needed. Therefore, Biztrak was customized by the vendor according to the needs by the resort. The hotel and the vendor worked closely together during the first month when the system was tested by the resort.

Hotel C

This 3 star hotel is located strategically in the golden triangle of Kota Bharu town. Guests staying in the hotel can reach many places within walking distance, such as most banks and financial institutions, shopping complexes, Chinatown, central and night markets and many more. With 70 luxuriously fitted rooms, the hotel also offers safe-deposit boxes and parking free to all guests. This hotel has a hall with seating capacity of 230, an ideal venue for conferences, weddings and receptions. There is another smaller hall which can be flexibly divided into meeting rooms that comes with a complete range of audio-visual equipment. The hotel is located in a state which is close to its northern neighbour of Thailand; therefore, the restaurant in the hotel offers a wide range of Thai, continental and local cuisine.

This hotel is using the IFCA accounting system for front office, the UBS accounting system for back office and Head Office System (HOS) for the food and beverages department. They have to transfer the figures from IFCA and HOS to UBS manually. The licence for the HOS has already expired but because of the cost they feel unable to renew the licence. They cannot use IFCA throughout the hotel because IFCA is too expensive. The front office or back office staff are not familiar with IFCA or UBS. Almost all staff need training to become familiar and up to date with the systems but the hotel cannot afford to pay for training fees. Only five accounting staff handle the UBS, which is found to be not so compatible with the hotel's operations. The main problem for the hotel at the moment is the reduced sales level; therefore, all staff are affected by this and are just 'satisfied' with the current situation without being able to demand anything better.

Hotel D

This deluxe 5 star resort can be reached from Langkawi international airport in 30 minutes. It is located along a bay which leads down to the clear waters of the Andaman Sea. The hotel offers 136 spacious and luxurious rooms. All three restaurants offer varied cuisine, including Malaysian, international and fusion cooking. The spa in the hotel offers a purifying and rejuvenating experience where quests can choose from aromatherapy, traditional Malay/Thai to the popular ancient Ayurveda treatment. Guests can also relax in two freshwater swimming pools and a saltwater pool, or join other members at tennis courts, sauna, steam room and gym.

Currently, the hotel is using the Biztrak accounting system for accounting purposes, which has been in use since 2004. The front office uses the Guest Centrix system and for stock control, Property Management Software (PMS) system is used for purchasing

and costs. The hotel is planning to have one system to be used by all departments, which is a more integrated approach. There are twelve accounting staff dealing with the Biztrak and all staff are familiar with the use of the system. However, they are using the Biztrak until trial balance only; after that, they manually transfer all figures to excel to produce final accounts and management reports. According to the accounting manager, the hotel does not have major problems with the accounting systems now in use. They will seek the vendor's help if there is a problem, and the vendor will advise by telephone or the internet, or if there is a major problem the vendor will attend the site to fix the problem.

Hotel E

This resort hotel is secluded by a hill as its natural setting by a white sandy beach. With a panoramic view of the Straits of Malacca, it is located on one of the famous beaches in Langkawi called 'Pantai Tengah'. All 102 rooms at the hotel come with hardwood furnishings and large windows that offer plenty of natural light. Apart from free parking, guests can benefit from the safety deposit boxes and luggage storage facilities offered at the front desk. With free Wi-Fi, guests can check emails from family, or up-date the news while enjoying a variety of European dishes for breakfast at a cafe or enjoy dining options including local and Western food at another cafe. Only 10 minutes drive from Langkawi International Airport and 20 minutes drive from Kuah town, this 3 star resort hotel welcomes all guests, both local and international.

The accounting function in this hotel is outsourced to an accounting firm. Only one accounting staff is sent by the accounting firm to handle all accounting matters in the hotel; however, she gets full support from other staff in the accounting firm if she needs their help. The hotel is using MYOB version 12 at the moment. The system is for

accounting purposes only. Front office and F&B do not have a computer system to keep records of transactions; therefore, all transactions from other departments have to be manually transferred to MYOB.

Hotel F

This 3 star hotel is located on a long white sandy beach overlooking the South China Sea of Terengganu state, which is well known for its rich natural beauty, long coastline of beautiful beaches, untouched rainforests, stunning islands, culture, tradition, arts and heritage. The resort can be reached within a 35 minutes drive from Kuala Terengganu airport and Kuala Terengganu town or seven hours drive from Kuala Lumpur. Being situated on 37-acres with a private lagoon adds to this already beautiful landscape. It is an ideal location for business meetings. For deep-sea diving enthusiasts, Merang town is also the gateway to the nearby diving haven islands of Redang, Bidong and Perhentian. The resort features beautiful sea-facing terrace rooms, all equipped with modern facilities. It is possible to choose from the various room categories available.

The hotel is using Head Office System (HOS), an integrated system to manage all transactions in all departments. For back office, two staff are enough to deal with all the tasks. However, the system is not fully utilized by all departments because they do not have enough internal expertise to handle it. They also have problems with the vendor who is located in Kuala Lumpur, which is far from the hotel. They deal through telephone or internet if they are having problems. With the internal and external expertise problems, the hotel is currently not taking full advantage of what is offered by the system.

7.3 AIS in the Hotel Industry

Hospitality is a major part of the tourism industry of the country. In fact, the contribution to GDP from the hotel industry is the highest compared to other industry segments such as transportation and shopping. Therefore, it is important that the hotel industry performs well to satisfy customers and to give a return and value for money spending in the hotels. One of the main aspects in hotel management is the use of an accounting system that can help the management to make better decisions about the business, its management and opportunities. The quality of the AIS in any hotel is important as mentioned by Hotel B:

> "*Every hotel should choose a system which is affordable and most importantly, the system should serve the purposes. If it cannot serve the purposes, it is a bad investment and in the worst situation, bad systems will affect the way the business is run.*" (Hotel B)

The nature of medium to large hotels with many departments, cost and revenue centres, and many staff, receiving thousands of customers every year and dealing with a significant number of suppliers, makes it difficult for accounting staff to manage all transactions manually or when using an inefficient system. Accounting becomes a very tough and challenging aspect of business operations when dealing with a large scale and variety of tasks simultaneously. Management of short-term problems and integration of operational considerations within long-term strategic plans are among the benefits offered by the accounting information to a firm (Mitchell et al., 2000). Hotel B agreed on the importance of an accounting system in today's environment by sharing the following thought:

> "*The accounting system is an important aspect in business managements nowadays, because business itself has become very complex. With the accounting systems that we currently use, we can solve our fixed asset accounting problems. Now we can do fixed assets verification in just one day.*" (Hotel B)

The business conditions and management situations within an organisation influence the perceptions of the importance of AIS among the staff. Traditionally, AIS have been viewed as having a narrow scope and focus on events within organisations which only provide financial related information and have a historical orientation (Mia, 1993). It is important to further understand how accounting managers in the hotel industry perceive the importance of modern AIS beyond the narrow scope of traditional accounting. Traditional AIS are far from being able to adapt and change, to support business development, critical business processes and models, and satisfy users' information requirements, which are constantly changing (Paul, 1994). Hotel C is concerned about the needs of the department only, mostly because of the current sales decline and therefore, the hotel cannot hope to buy a better system. Hotel A is also concerned more about the applications needed in daily routines.

> "*If we have an AIS that caters for all our needs, that is good. We cannot demand to have extra applications at the moment because our hotel is struggling to stay in the market. We don't have a website to promote our hotel. We depend on tourist agencies to put our name in their websites. In this situation, accounting based applications is all we need for our department. If sales increase maybe we can think of a better system, more applications and so on.*" (Hotel C)

> "*We are more concerned about accounting related applications compared to other applications. The AIS that we use must have all major accounting applications such as accounts payable and receivable, general ledger, payroll, budget etc. Other applications are needed too and if provided is an added advantage but to perform our basic tasks we need accounting-based applications more.*" (Hotel A)

The roles of AIS have been changing over the last decade with the developments in accounting, IT and IS. Resources-Events-Agents (REA) and Enterprise Resource Planning (ERP) are two examples of the implementation of new accounting models

drawn from the evolution of database technology. Accounting is now being viewed in a much broader perspective to also include non-financial, external and future-oriented data (Abernethy and Guthrie, 1994), and with added emphasis on the economies of business operations and strategic management (Brecht and Martin, 1996). Therefore, the accounts managers should have a wider perspective and appreciate the broader scope of AIS, as in the case of Hotel B, who looks at the importance of other applications to support the use of AIS, while Hotel D is capable of providing the latest technologies to staff and customers to maintain its good reputation as a large and established 5 star hotel.

> "*Of course accounting-based applications are the most needed for us, however, other applications are important too. Accounting-based applications are taking over the manual accounting system. To produce accounts, we need support from other applications such as inventory management, raw materials purchasing etc. To produce reports we need presentation packages etc*." (Hotel B)

> "*Accounting-based applications are major in our daily work but other applications are also available here. The hotel provides most up-to-date IT infrastructure and applications for staff and customers*." (Hotel D)

Even though the accounting manager of a hotel understands the capabilities of various AIS available, the decision to invest in a certain AIS depends on top management who look at the sales level and prosperity as the main factor in decision making. The hotel industry depends on government and public spending either locally or internationally to survive. Certain hotels are very much dependent on government agencies and local people; therefore, when the government cuts spending or during an economic downturn, these hotels suffer a big drop in sales. During an economic crisis, some hotels struggle to stay in operation; some may even cease to be in the market. Holidays become unnecessary activities to many people during economic uncertainty. Hotels that belong

to a government can survive better compared to independent hotels because these hotels get priority booking from the government agencies. Hotel C is an independent hotel which was affected greatly recently when the government cut spending. As a hotel situated in a town centre, it is more dependent on business and shopping trips. It receives a lot of sales from government events when the economy is stable.

> "*Overall economic problems in the country affect our sales very much because if the government cut their spending, we cannot sell our rooms or other services.*" (Hotel C)

Hotel E also depends on certain events that are held on the island and also during the school holidays. Apart from these seasons, the hotel struggles to achieve certain occupancy rates. This problem was shared by the account manager of Hotel E as follows:

> "*We are very much affected by the national situation because we depend on the local market. If there are big events such as LIMA (Langkawi International Maritime & Aerospace Exhibition) or other main festival celebrations that take place here, we will be fully booked. But other than peak seasons, our occupancy rates are only at 30% to 40% and will increase to 50% during school holidays.*" (Hotel E)

Hotel B has enough support from the government because it is owned by one of the state governments. When the government cuts spending, independent hotels will be affected but this hotel will still receive a certain amount of sales from the government, in addition to the sales from customers locally and internationally to maintain its business.

> "*This resort is owned by the state government and therefore we are very much dependent on government trade. Almost 50% of room sales come from government agencies.*" (Hotel B)

With some other hotels, normally big hotels, they are not worried much about local economic conditions because their main customers are international. They focus their

sales mainly on international tourists. They spend a lot of money for promotion abroad with less attention being given to attracting local customers. However, they are still affected by local political instability, government policies and other factors which may directly or indirectly affect their business.

> "*Our main market is from European countries; therefore, we are not affected when the government cuts spending. In fact, the local market contributes less than 10% of total room occupancy.*" (Hotel D)

Interestingly, these interviews open up a number of hotel industry issues about factors that need to be considered when choosing AIS and factors that affect their sales. This can be used to further understand AIS acceptance and satisfaction in the hotel industry in Malaysia.

7.4 External Factors to Influence PU and PEOU

7.4.1 Top Management Support (TMS)

The current market situation locally and internationally is a major determinant in top management decisions about the whole hotel operations, including the usage of the AIS. Effective information processing helps information flow more smoothly to decision makers, who can make more informed decisions quickly, thereby giving the organisation a substantial competitive advantage (Barney, 1991). However, AIS investment is harder to judge in the hotel industry as managers cannot directly see the impact of the investment to boost sales. In fact, the lodging industry saw no increase in revenue after spending $7.6 billion on IT between 1995 and 2000 (after controlling for the effects of the booming economy) (Brown and Stage, 2002).

This finding is in line with the decisions made by the top management of Hotel C. This hotel chose to retain the current AIS even though the staff in the accounting department

found the AIS could not cope well with the hotel operations. The top management could not see the importance of AIS to improve sales. Therefore, they decided not to invest to change the AIS.

> "*Top management support the idea to improve the accounting system. But because of a sales drop, we cannot afford to change the system at the moment. We are just satisfied with the current system as advised by the accounting firm. Don't say change the system, we don't even have funds to send staff for training. We haven't paid consultation and maintenance fees for some time now so we won't get support from the vendor if anything happens to our system.*" (Hotel C)

The top management might choose to use the cheapest AIS as long as it can provide financial information because in most hotels, the scope of AIS might still be viewed too narrowly, as just to produce traditional historical figures. In Hotel A, the AIS was changed to satisfy management and to pay a lower monthly cost; however, another group of users, the accounting staff, found it less efficient compared to the system previously used. As commented by the manager of Hotel A, they have to just accept what is decided by the top management for the hotel, not only for the benefits of the accounting department.

> "*Top management decided to change the system because of the cost. The monthly payment to the vendor was expensive for the previous system compared to the current system. As a user, of course, I prefer the previous one and the changes have a negative impact to the usage because there is no link between front office and back office, but if we cannot afford to pay because of slow business, there is no point in keeping it or we lose our whole business.*" (Hotel A)

The situation is different in Hotel B, where the accounts manager was the one who decided which AIS to use. He took the best AIS for the department and what was affordable by the hotel. The top management and the account staff are happy with the AIS performance. The account manager noted that:

> "*Top management give their full support to improve the system. So far they are satisfied with the system and we are not going to change the system in the near future based on the current market situation.*" (Hotel B)

Hitt and Brynjolfsson (1996) argue that to the extent that IT assets are equally available to all of the participants, theoretically, in a competitive market all of the firms will make optimal IT investment decisions in equilibrium, and no firm will gain an advantage from their spending per se. However, in practice and given a complex business context, failure to invest in IT resources and capabilities can put a firm at a competitive disadvantage in terms of operations and the performance of its customer service process. For this reason, firms have a strong incentive to invest in the IT assets necessary to maintain a competitive level of service (Ray et al., 2005). As a 5 star hotel, it is important for Hotel D to remain competitive in the market by offering up-to-date IT services to their customers and staff. Customers have higher expectations about 5 star hotels including the technologies used which offer to make their stay more exclusive.

> "*Our directors give their full support for the use of the latest systems. The hotel is planning to invest a lot in the near future to have an integrated system. The vendor has already been to demonstrate the system and so far top management and senior executives from various departments are satisfied with the system. Top management realize the importance of an integrated system to improve operations. Our department also sees the usefulness of a better system than what we have now where we need to transfer manually from Biztrak to Excel.*" (Hotel D)

The information related to the *TMS* from the interviews can be used to explain the results generated from the survey previously presented in Chapter Six. In most of the hotels, top management has the final say about which AIS to use because it is about money to be spent by the hotel. The survey findings in Figure 6.2 (Chapter Six) show a slight support for a relationship between *TMS* and *PU*. The survey result can be

compared with the finding from the interviews, where some top management decided to choose the AIS which is affordable rather than the AIS which has greater benefits or more usefulness to the users. However, after some time, the users adapt to the AIS provided and accept the AIS because they have no choice but to use the system that they have.

The responses of managers in this section appear positive, though a number point out financial limitations which limit system development. During the interviews the opportunity was taken to obtain examples or probe the response to confirm reliability (see Appendix 3).

7.4.2 Information Systems Sophistication (ISS)

The interviews revealed insights into the *ISS* in these hotels. It was found that the managers of the hotels realized the importance and benefits they could get from an integrated system. However, an integrated system alone cannot be a benefit. It should come together with other aspects such as internal expertise in terms of IT expertise and knowledgeable staff to manage tasks, good support from the vendor, continuous training internally and externally, up-dating of the systems and the users. If those requirements cannot be fulfilled, most account managers prefer to have a non-integrated system as commented by Hotel B below:

> "*We are not using an integrated system. It is preferred that way because if anything happens to the system, the whole hotel will be in trouble especially the accounts department. Without the system we have to do accounts manually. To have integrated and sophisticated systems, there needs to be enough support from IT staff. Without this support, IT sophistication becomes a misery. At the moment, we don't have enough IT expertise that is why I think we cannot have more sophisticated systems. It is better that we have a standalone system where we have control over the system."*
>
> (Hotel B)

When hotel management decides to invest in an integrated system without taking into consideration the IT planning before and after the implementation, there might be problems for the system and the users. An integrated system that is not fully utilized is a waste which should be avoided. The system is not an added value to the operation but rather a burden that gives negative returns. If this situation occurs, accounting managers would prefer to have a system that can be controlled by the department only, as expressed by Hotel F:

> "*We have an integrated system, however it is not fully utilized because we do not have enough expertise to use and control it. Currently it is used by certain departments only. The accounts department cannot fully utilize the system because we do not have support from other departments. It is inefficient to have a good system if we cannot use it to the limit. In return, it gives us problems to run our department. Based on our situation, I would prefer to have a non-integrated system."*
>
> (Hotel F)

Several studies have shown that the scale of IT resources (e.g., size of IT investments, extent of IT penetration) is strongly linked to firm performance (e.g.: Barua et al., 2004; Dehning et al., 2003; Devaraj and Kohli, 2003; Im et al., 2001). Therefore, the availability of AIS or IT alone is useless if the users have no interest to take advantage of the technologies and potential offered by the systems. There should be interest from the users to explore and exploit the system. The vendor of the system can explain the benefits offered by the systems and provide training to familiarize the staff with the system. However, anxiety with the IT happens when the staff are afraid to try something new. It should be an integrated solution to help to increase the efficiency of the overall hotel operation, but often it is not. This kind of problem is shared by the account manager of Hotel E who is happy to have a non-integrated system for the accounting department only to avoid problem with other departments.

> *"Front office does not have a system to deal with transactions and to keep records of the guests. They refused to have a system because they prefer to do it manually. Top management suggested a system but they don't get support from all departments. They found IT as something too difficult to deal with. With these problems I prefer to have a standalone system in the accounting department only."*
>
> (Hotel E)

The responses from the interviews about the relationship between the *ISS* factor and the *PU* of AIS in the hotel industry discloses an interesting fact that the more sophisticated the information system is, the more problems faced by accounting people in the accounting department. The result from these interviews illustrates the result generated by the survey questionnaire previously reported, that is, the negative relationship between *ISS* and *PU*.

7.4.3 Involvement

The involvement of users in choosing, designing, specifying and clarifying the input and output of the required AIS, or being involved in modification and changes of the AIS, I was commented on by a few hotel managers in the interview sessions. When accounts managers are themselves involved in some or all of those processes, a better degree of acceptance of the AIS, from all the users is revealed. The fact that accounting people know better what is needed is an important aspect in deciding the type of AIS to use to support the operations of the hotel. The accounts manager of Hotel B talked about his experience in choosing and testing the AIS before the hotel decided to continue using it.

> "*I am the one who chose the accounting system. I have been working with this hotel for almost 10 years now. So I am very familiar with the operations of the hotel especially the operations of the accounts department. I have a good contact with the accounting firm which supplies the system. We tested the system for a month with guidance from the accounting firm. After a month's trial we decided to continue using it. I am involved directly with the customization of the system*

> *according to our needs. User involvement is very important because we can have a system that serves our need rather than we have to follow what is provided by the system. A system that can fulfil our needs will be useful to everyone.* "
>
> (Hotel B)

The AIS in hotel D was also chosen by an expert who has knowledge and experience in using it before recommending it to Hotel D. As a result there was acceptance of the system by the whole department, without any major problems.

> "*One of our managing directors was an accountant. He worked with a five star hotel before joining this hotel. He used and was familiar with the system and so, he recommended the system to us. He dealt with the vendor in designing the system for us. So at the moment we have a system that is useful and fully supports our operations. Even though it is a standalone system, it is enough to satisfy our needs*".
>
> (Hotel D)

The above two experiences should be compared with the experiences of other hotels. The accounts manager in Hotel A had no idea who decided to choose or change the AIS. She just uses the AIS which may have been chosen by another hotel management, part of the same ownership. The accountant in Hotel C also had a similar experience; he continues to use the AIS which was chosen by top management before he joined the hotel. As for Hotel E, where the accounts department is outsourced to an accounting firm, the AIS was chosen by the accounting firm with agreement by the hotel top management. The users in all the three hotels were not involved in any activities related to the choice or change of the current AIS. There are some problems with the AIS in all the three hotels which may be related to the extent of involvement in choosing, modifying and changing the AIS in those hotels. All the three managers commented similarly as follows:

> "*Top management make the decisions to change the system with no involvement from accounting staff in this hotel. The accounts managers in the other two 4 star hotels are maybe involved and decided to change the AIS, I am not so sure but*

as far as I am concerned, accounting staff in this department were not involved at all". (Hotel A)

"One of the managing directors decided to use UBS, I don't know why he chose UBS, but I think UBS is not suitable for hotel operations. UBS was already here when I joined this hotel". (Hotel C)

"I am working for an accounting firm so I don't know about the process of choosing the AIS. Maybe it was recommended by the accounting firm and agreed by the top management of this hotel. I really don't know I just use it." (Hotel E)

Involvement by accounting staff in the process of choosing, designing, specifying and clarifying the input and output of the required AIS, or involvement in modification and changing the AIS was found to be an important influence on the *PU* of the AIS. When users themselves are involved in those processes, they can have a system that really serves the purposes; therefore they will find it more useful in daily operations. The findings from the interviews supported the results from the survey.

7.4.4 Training

Training is becoming an important factor when a firm installs a new AIS, up-grades the current AIS, or there are new users who join the firm. It is crucial for new users who have little experience in the use of AIS to have training to get to know the AIS, before they can use it in their workplace. Without training, new users cannot see the importance of the AIS and just use it as a routine. However, training especially external training is related to cost, which has to be paid to the trainer or expert. Training normally incurs quite a lot of cost which sometimes is avoided by some hotels. The management in Hotel A only allowed one month training to staff when they first bought the AIS. After that, no more external training was given. The same happened to Hotel D where external training was argued to be not important anymore, after 7 years of using

the AIS. Both Hotel A and Hotel D only provided internal training to new staff. In other words, it is knowledge sharing from senior staff to junior staff, which is informal training between them. The new staff continue using the AIS with the guidance from the seniors.

> "*Training was only provided by the vendor in the first month of buying the system. No more external training was provided after that because of the cost. New staff only received internal training.*" (Hotel A)

> "*After 7 years of using this system, there is no more external training given to the staff. We only have internal and informal training between staff.*" (Hotel D)

Some hotels just provided a minimum external training from an expert, to cut costs. Other than this, the staff have to learn by themselves from their experience, reading the manual, asking around from friends, seniors and so on. The staff in Hotel E shared their experience when only given a 4-day training course when the AIS was up-graded. A worse situation happened in Hotel C where no training was provided to staff at all because the hotel could not afford to pay. Top management in Hotel F also do not believe training is necessary to be given to staff, even the staff themselves knew they were not performing well with the system because of their lack of knowledge and experience.

> "*The system was up-graded about a year ago. I was given a 4-day training course to familiarize with the changes and that's it, no more training after that.*" (Hotel E)

> "*No training is provided by the vendor because we do not pay the consultation fees. The staff just learn about the system themselves. Therefore, we cannot fully utilize the system.*" (Hotel C)

> "*When I first joined the hotel, I was given a 2-day training course about the system. For more than a year now, no training has been provided to staff. We need training but the*

> *management don't bother about it, maybe the training is too expensive*." (Hotel F)

However, there are some hotels that do not face a problem with the staff even though external training is only provided in the earlier implementation stage of the AIS. When there is low staff turnover, the management of the hotel do not have to worry about the training of new starters. When almost all staff remain in the hotel for a long period, and they are using the same AIS for quite some time, they become familiar and expert in their work. The manager of Hotel B explained the situation in his department:

> "*We tested the system for one month with guidance from the vendor before we purchased it. That's the only training we have. However, we don't have problem with staff turnover, most of the staff that received the training are still here, so we don't need further training at the moment*." (Hotel B)

Training is an important factor for users to get to know a system. From training they acquire knowledge and adapt it, how the system can help them in managing tasks, how the system works faster and improves work efficiency etc. Explanation should also be given as to why the company choose the system instead of other systems. All users should have clarity about the system they are going to use in their routine. It is not appropriate when users without knowledge and experience have to start using a system with little vision of how to use it fully. These interviews revealed the important insights about the training factor in the hotel industry in Malaysia. Training is sometimes perceived as not important from the top management perspective because of its cost. Therefore, training failed to influence PEOU of the AIS as revealed in the survey shown in Chapter Six.

7.4.5 Experience

Use of AIS with and without experience can never be the same. If users have experience in implementing, maintaining or modifying any AIS, they probably find it is generally easier to deal with. As long as accounting staff have a good basic knowledge in accounting and have experience in using any AIS, they probably find adapting to other AIS not so difficult. Staff in Hotel B did not have a problem in changing to a new AIS because they had experience in using other AIS before. With one month training, all staff can easily adapt to the new AIS and perform well.

> "*Accounting staff have experience in using Acctrack before, but because of the cost, we decided to try new software. We tested UBS and Accpack before finally chosing Biztrak. Our experience in using Acctrack makes it easy to use Biztrak because there are certain parts in Biztrak which are similar to Acctrack.*" (Hotel B)

Experience with the AIS is also related to length of time and experience working and dealing with certain AIS. The longer the working experience, there is more chance to use different AIS and hence better experience with that AIS. The manager in Hotel D has more than 20 years'experience with hotel operations, and handled a few systems during that time. Therefore, he found AIS easy to deal with. The user in Hotel E has been using the same AIS for 7 years and even though she does not have experience in any other AIS, continuing to use the same system has made her familiar with it, gaining a good knowledge and understanding of this AIS.

> "*Before using the current system, I have experience with SUN accounting system for quite long time with a previous employer. It was a good system too. I don't have problem to implement and maintain the current system. In fact, I modified certain formats from the system to produce reports. Because when I produced reports using the format given by the vendor, our directors weren't happy and they asked to change the format. So I came out with my own format and it was more acceptable. After 20 years' experience with hotel operations and systems, I can manage AIS easily.*" (Hotel D)

> "*We have been using the system for 7 years now. I have good experience in using and maintaining it. My knowledge about the system is good. With all this I found AIS easy to use.*"
>
> (Hotel E)

It is interesting to explore how experience in using, maintaining, modifying or implementing any AIS can influence PEOU of AIS. The interviews help to explain the results obtained in the survey, where experience was found to be highly influential in the PEOU of AIS. It has been shown that when users have experience in using, maintaining, modifying or implementing AIS, it helps them to better accept any AIS and they will find it easier to use because of their previous experience.

7.4.6 Internal Expertise

Internal expertise relates to whether accounting staff are adequate and skilful at using the AIS and also whether the IT staff are adequate in supporting the AIS services. If accounting staff are not sufficiently skilful at using the AIS, it will give problems to the whole department and hence, operations will become slow and inefficient. Other departments of the hotel are likely to be affected too. In order to ensure all tasks can be managed smoothly and efficiently, all staff need to maintain and refine their skills. As explained by the manager, Hotel C had problems with accounting staff; however, because of other issues in the hotel, they could not resolve the problems.

> "*Our staff do not perform well with the AIS, they need training however, the hotel cannot afford to pay for the training. Personally I am not happy with the staff because they make mistakes and I need to monitor them closely*".
>
> (Hotel C)

The other hotels seem happy with their staff, which shows the importance of internal expertise to help manage the daily routines. Hotel B has enough staff to run the department. Where there is a good AIS in operation, combined with a good team in the

department, accounting matters become easier to handle. Even when there might be occasional problems, they can deal with the problems and continue their work.

> "*All accounting staff have good knowledge in accounting. We are also using the system for quite a long time now. So far we do not face many problems with the system. We can deal with the problems so we are satisfied with the performance of the staff. I found the system easy to use, the staff also found it easy to use, so we are ok with the system.*" (Hotel B)

The staff in the accounting department of Hotel D work professionally and perform their work very well. They also get support from IT people when needed. Therefore, Hotel D has enough internal expertise to manage tasks and satisfy the management. Hotel E is in a different situation where one lady is the only accounting member of staff in the hotel. However, she gets enough support from the external accounting firm when she needs it. Both Hotel D and Hotel E, therefore do not have problems with internal expertise as commented below:

> *"We have a good team here in the department. Everybody knows their jobs and performs well. We get enough support from the IT people."* (Hotel D)

> "*Accounting in this hotel was outsourced to an accounting firm. Even though I am the only member of the accounting staff that controls the overall accounting operations in this hotel, I get enough support from my accounting firm. Normally at the end of the year, extra staff will be sent here to help me with closing the accounts and preparing all the reports.*" (Hotel E)

Hotel F is using an integrated system; therefore, internal expertise requirements are more crucial than with a standalone system. Accounting staff do not have problems to handle the system, but some other departments are not performing well. They also cannot get support from IT staff to manage the system. The problems with internal expertise are shared by the manager in hotel F, noted as follows:

> "*We have enough accounting staff however we cannot use the AIS to the fullest extent. We can manage our part from that integrated system but other departments cannot. Training is important for all staff, even from other departments who deal with the system especially IT staff*". (Hotel F)

In terms of internal IT support, almost all hotels, who participated in the interviews, revealed that IT support from inside the hotel was not sufficient to help them in AIS. They need to seek external support especially from the vendor when they have problems with the AIS.

> "*IT staff cannot deal with the accounting system so they cannot support the system. We contact the vendor to fix any problems*". (Hotel A)

> "*So far we haven't had so many problems with the AIS. I don't think IT staff can deal with AIS, I am not sure because we just ask the vendor to settle our problems, not IT staff*". (Hotel B)

> "*IT staff need training, they can't handle the jobs we ask of them. We can't depend on them for help*". (Hotel F)

The interviews here are in contrast with the results from the survey, where 77% of the respondents in the survey agreed that the IT staff are adequate to support the accounting system services. When all staff in a department can take responsibility and perform well, it makes every step in the process run smoothly and efficiently. Internal expertise is crucial when dealing with AIS because it is about accounting, IT and IS, knowledge and skill. Accounting staff need to be knowledgeable about accounting and at the same time skilful at using a system. With these two aspects, accounting staff can manage AIS without any problems. The survey confirmed that internal expertise very much influences *PEOU* of AIS.

7.4.7 External Expertise

Vendors or dealers, consultants, accounting and audit firms and government agencies are among the external expertise that are believe to impact the use of IT/IS by an organisation. Their expertise could help in terms of advice given and training provided, maintenance, technical support etc. However, the interview respondents revealed that they were not depending on external expertise much in their operations except for the vendors or dealers. Their experiences in dealing with external expertise are shared below:

> *"We are choosing the current AIS because the vendor who provides it is close by so easy for us to call them when we need their service. We dont't have a problem with the vendor, but we don't have contact with consultants and government agencies about our use of IT. We only dealing with the accounting/audit firm for the purpose of auditing the accounts at the end of financial year".* (Hotel B)

> *"We are not satisfied with the vendor, because of distance, they refuse to come over if there is a problem with the systems, and normally they just guide us through telephone calls. Only once or twice a year they come to fix the major problems or to up-date the systems. We don't seek for any help from other external parties with regards to our AIS or IT"*
>
> (Hotel A)

> *"If we have problems with the systems, we will call head-office in Kuala Lumpur. They will contact the vendors for us if the problems are too complicated to be dealt with by the IS staff. The vendors are in Kuala Lumpur too, so normally it will take ages to settle problems. We never have contact with IS consultants or related government agencies about the systems we are using. Accounting and audit firms also never interested in our systems. They just do audit using the information provided to them".* (Hotel E)

External expertise was found to be less important in terms of AIS or IS use by the hotel industry. Their expertise is not utilised by the systems' users to improve usage of or

satisfaction with the systems. The findings from the survey also demonstrated the same and thus the results from interviews are further confirmed the findings from the survey.

7.5 The Internal Dynamics of the AIS

7.5.1 The Impact of PU on Usage and Satisfaction

Whether users perceive the AIS is useful, is an important determinant in the acceptance of a system. When they perceive AIS as a useful system to help them in their work, they tend to use AIS more. They will rely on the AIS and believe that AIS can improve their job performance. Hotel D found AIS is very important and useful to them. They are very much depending on AIS to meet their job requirements. Their efficiency in the job is related to the efficiency of the AIS. The manager stressed that:

> "*AIS is very important and useful to our hotel operations. With the demand from the management to have accounting information at their fingertips, accounts for various departments need to be managed effectively and efficiently. Without the system, I cannot manage all the tasks within the time available. At the end of the day, all managers will turn to the accounts department to check their performance.*"
>
> (Hotel D)

The manager in Hotel B talked about the competitive advantage they can get from the AIS. Management can improve their performance using the capabilities offered by the AIS. Apart from producing the historical accounting figures, AIS can be used for budgeting purposes or forecasting of future sales, expenditures, room rates and so on. Bharadwaj (2000) proposed that if firms can combine IT related resources to create a unique IT capability, it can result in superior firm performance. Without the AIS, the work of accounting people will not be easy, therefore, AIS is very important to an accounting environment today. Hotel B commented that:

> "*For me, AIS is crucial. It's too important in today's businesses. If we want to beat our competitors we cannot do things manually. Our top management rely on accounting figures to make decisions. The faster they get the figures, the faster they can make decisions.*" (Hotel B)

The comments given by Hotel D and Hotel B above would be different in the situation faced by Hotel C. The manager in Hotel C perceived AIS to be very useful; however, because the AIS cannot cope with the operations of this hotel, the usage of it will be limited. When AIS cannot serve its purpose, its usefulness as well as the usage will be reduced.

> "*Personally I found AIS to be very useful in hotel operations but at the moment we are using an AIS that is not so compatible with the hotels' operations, for example, the system cannot transfer service charge to payroll automatically so we have to manually do it one by one,. We also have problems to transfer the final figures of the stock into the accounts. So again we have to do it manually. These problems reduced the perceived usefulness of the system and it will definitely affect usage. We hope to change the system but at the moment we cannot afford it.*" (Hotel C)

It does not matter whether the AIS is a stand-alone or an integrated system, as long as the users get what they want, they will be satisfied. Hotel B and Hotel E are both satisfied with the AIS they are using because they believe that the AIS enhances effectiveness in their job.

> "*Even though our system is a standalone, it is still very useful to our department. We don't face problems with accounting matters. We are able to satisfy all managers with the reports they require. The AIS that we are using now does all we need, that's the most important thing.*" (Hotel B)

> "*In the end, all other departments' transactions will be transferred to the account department. It is like all the transactions stop at this department. We need the system that not only satisfies the department but also satisfies all other users. AIS serves its purpose apart from occasional problems that sometimes occur. But overall, it is still very useful to the whole operation.*" (Hotel E)

Even though the AIS is perceived as useful by the users, its use can be reduced if the AIS is not compatible with the organisation's needs and/or the users are not skilful enough at using it. When this happens, they will not be satisfied with the AIS. Hotel C still found the AIS to be very useful even though the staff cannot perform well. The manager can see the benefit given by the AIS and is satisfied with the limited capabilities it has.

> *"We do not fully utilise the system because of staff problems, however, the AIS itself is very useful. I think without AIS our problems would be much bigger. At least I can prepare reports faster."* (Hotel C)

How users perceive the usefulness of the AIS is very important for the usage of and satisfaction with the system. These interviews help to explain further the results generated in the survey which found that PU of AIS is highly significant to the usage of and satisfaction with the AIS.

7.5.2 The Impact of PEOU on Usage and Satisfaction

It is important that users are comfortable with and find it easy to use the AIS. When the learning process is easy, users will be interested and excited to discover more about the AIS especially for a new user who does not have much experience of the AIS. Staff in Hotel B customized the AIS according to their needs when they first bought it; therefore, all staff found the system easy to use.

> "*I found the system is easy to use because when we bought it, the vendor customized it according to our needs. The staff also found it easy to use. I never heard any complaint from them. When the system is easy at use, it makes us happy and we use it to the maximum."* (Hotel B)

Hotel A did not customize the AIS according to the needs of the hotel but rather it is a copy from another hotel. At the beginning they found the AIS was not easy to deal with

because there are certain parts of the AIS that cannot cope with their requirements. However, after they continued using it, they were able to manage the AIS and get used to it. Now they find AIS is easier to use and AIS makes them more able to carry out their responsibilities.

> "*After we get used to the system, we found it quite easy to use. We manage it better now. When we get stuck with the system, we avoid using it or we use it because we have no choice. But when we are comfortable with it, of course the usage will increase and we perform better."* (Hotel A)

Hotel D also did not find any difficulty with the AIS because it was easy to learn. New staff did not find it difficult to start using it with guidance from existing staff, even without extra training from outside expertise. When users are happy because the system is easy to use, the usage will be smooth and high.

> "*The system is user friendly, it's easy to use. Even though we do not provide training to the staff for 7 years now, but they can manage jobs efficiently. Only internal training is given to newcomers but they haven't had problems so far. So the usage of the system is smooth too.*" (Hotel D)

Users are likely to be more satisfied by the AIS when they perceive the AIS is easy to use, compared to users who have a negative perception of it, that is, if in the first place, they think it is going to be difficult to deal with the system. The perception will affect the way the users handle the system and will affect their satisfaction with the system too. Users will be satisfied and pleased with their experience of using the AIS as expressed by Hotel B.

> "*As I said before, the system is easy to use, so we are happy and utilize it fully. We invested a lot to get the system and we are satisfied with the choice, it will remain in use for a long time.*" (Hotel B)

Hotel E has used the same AIS for 7 years. The AIS will be up-graded when a new version becomes available in the market. The staff get to know the AIS very well and

perceive the new version will be easy to deal with too. They can be easily satisfied with the AIS because they can manage the whole thing without problems.

> "*I do a full set of accounts and prepare the reports by myself. So I use the system fully from A to Z. It is easy to handle, no problem so far. I agree with the statement that when the system is easy to use, we are more satisfied with it.*"
>
> (Hotel E)

Why is*PEOU* an important determinant of *usage* and *satisfaction* of the AIS? The survey disclosed that *PEOU* is highly influential of both *usage* and *satisfaction* with the AIS. The interviews provide a clearer explanation about this. When users perceive the AIS is *easy to use*, easy to learn, easy to get what is needed or it makes the job easier, it will increase the frequency of AIS use and users will depend on AIS too. It also makes the users satisfied with its efficiency and effectiveness.

7.5.3 Usage and Satisfaction

Users will use AIS to the extent they are satisfied with it. The usage of the AIS in Hotel B is high because they are satisfied with the system. AIS has become the most important tool in their department.

> "*The usage of AIS is major to our department. We use the AIS in every single transaction. It gives what we need so the level of usage and satisfaction is very high. Even though it is not an integrated system, it is enough for us at the moment. We will keep using it until we find a better system that is affordable.*"
>
> (Hotel B)

There might be situations where the AIS cannot give the user all of what is needed. It should be flexible and hence meet various needs. A good AIS should be under the control of the users. If the AIS cannot be fully utilized because of some constraints, users will use it to the extent to which they are satisfied, as happened to Hotel A.

> "*AIS is a must for hotel operations. Maybe there will be some problems with the system, but users need to fix it to their needs. With budget constraints, we try to maximize the usage.*

> *We cannot say we are fully satisfied with it but if it can solve our major problems, it is good enough and can keep us continuing in our work.*" (Hotel A)

Hotels that value the capabilities of a system will invest to get a good system. They can see the return from the investment. The system provides superior support to get competitive advantage in the market. Highly rated hotels need to offers high class technologies to impress customers and to suit the prices charged to the customers. Hotel D decided to improve their operations by investing to get a better system.

> "*To run a highly rated hotel like us and to compete in the market, we need a system that, if not better at least is at the same level as our competitors. At the moment, we are using a non-integrated system but the top management is at the final stage in dealing with the vendor to have the latest integrated system. At the moment, we are satisfied with the current AIS. It still serves our needs but to improve the hotel, we decided to invest a lot to get a better system.*" (Hotel D)

The survey has resulted in demonstrating that usage highly influences satisfaction with the AIS. The interviews explained this further by showing that the hotels were satisfied with the system because from the usage they know they can depends on the system. Usage and satisfaction are highly inter-related, as the survey showed. The more staff use it, the more satisfaction they get from it. In certain situations, where they use it to a certain extent only, their level of satisfaction is also limited.

7.6 Output - Organisational Impact

Determining how IT as a resource can create a sustained competitive advantage for a firm remains an unresolved issue (Barney et al., 2001). This is partly due to the fact that many factors affect firm performance and it is difficult to establish causality between IT investment and firm-level performance (Im et al., 2001). It is a tough job to relate the investment or the use and satisfaction with the AIS to the performance of the hotel. However, the interviewees were asked to give their opinion about how the use and

satisfaction with the AIS can impact the performance of their hotels. All respondents in the interviews agreed that the AIS directly or indirectly impact a certain level of performance of their hotels. The managers of Hotel D, Hotel F and Hotel B declared that the AIS indirectly affects all the indicators of performance given to them. They believed AIS can indirectly improve service quality, operating performance, customer loyalty, sales growth and overall performance of the hotel. At the same time AIS can also indirectly reduce operating costs. All the three managers of those hotels were commented below:

> *"All the items that you listed such as reduced operating costs, improved service quality, operating performance, public image and so on are indirectly related to the AIS, however, AIS is an important source to refer to in making management decisions. Managers and directors are relying on accounting reports produced by the AIS."* (Hotel D)

> "*If AIS cannot cater for our operational needs, it will impact efficiency and will then affect operations of a hotel. When the operations are in trouble, performance will be affected too. Therefore, I see AIS as one indicator for a hotel to run the business smoothly and efficiently. If AIS can satisfy needs, it will indirectly influence all the performance areas that you have identified.*" (Hotel F)

> "*Hotel operations are very much depending on accounting reports to make future decisions. For accounting systems to perform better, they need to be integrated with other operating systems in other departments. Therefore, AIS is only indirectly related to performance in these areas.*" (Hotel B)

The manager of Hotel A believed that the AIS can directly reduce operating costs. However, it is indirectly influencing the rest of the indicators. The manager of Hotel E is more optimistic, looking to AIS to make a bigger impact on the performance. The accountant trusted the AIS to reduce operating costs, improve service quality, operating performance and overall performance of the hotel. However, in terms of customer

loyalty and sales growth, she believes the AIS only indirectly influences these. The two hotels' managers share their opinions as follows:

> "*AIS can reduce operating costs in the long run. If the AIS fulfils our needs, we can reduce staff because the system takes over jobs that are done by the staff. However, AIS indirectly affects other kinds of performances. Such as improved service quality, operating performance and public image, AIS alone cannot do these but together with other systems that are linked to each other, it will make a bigger impact to those areas.*" (Hotel A)

> "*AIS is like one of the fingers, one finger cannot do much but all the fingers can do a lot. So the AIS is an important factor that contributes to the overall performance of a hotel. It affects efficiency, helps in decision making, it can help reduce operating costs if performed well, it can improve service quality and operating performance. However, in terms of improved public image, client's loyalty and sales growth, it maybe only indirectly influences those elements*." (Hotel E)

It is a big challenge to try to relate the impact of AIS usage to the performance of a firm. The challenge comes from the fact that there are many other factors that contribute to the performance of a firm. The research generated results which show usage and satisfaction with the AIS can significantly influence performance. It further verifies from the interviews that AIS can impact performance. AIS supports the whole operation of a hotel. It is not only used by the accounting department for the benefit of the department. Rather, the outputs from the AIS are used by all other departments and most importantly, AIS outputs are used by the management for decision making. Therefore, either directly or indirectly, AIS impacts performance.

7.7 Summary of the Chapter

The aim of this chapter was to provide richer and deeper understanding about the results generated in the survey. It is used as a basis of triangulation and confirmation of the survey. The six interviews from the hotels that also participated in the survey help to

explore and explain each relationship hypothesised in the research. There are some relationships that are not clearly experienced by all the respondents in the interviews; however, the interviews have helped in explaining the results of the survey. Both the results from the survey and interviews are now combined in the next chapter to compare to the literature to discuss further implications of the results of the research.

CHAPTER EIGHT
Discussion of Findings

8.0 Introduction

The implications arising from the results obtained from the hypothesis testing outlined in Chapter Six and the in-depth interviews in Chapter Seven will be discussed further in this chapter. A combination of information from the survey and interviews though triangulation will help to explain the usage of and satisfaction with AIS in the hotel industry in a Malaysian context. It is used to address the research questions and assess the achievement of the objectives stated for this study.

The discussions of the findings will be sub-divided into several headings based on the research objectives and hypotheses. The findings from the survey and the interviews will be combined to provide greater and deeper insights on the topic being researched. In the context of triangulation, the aim of the findings from the interviews is to support the findings resulted from the survey, so the findings from the survey will be disclosed first, followed by the interviews.

8.1 The Status of AIS adoption in the Hotel Industry

Computer systems are widely used in Malaysia; however, the extent of AIS use in the hotel industry is unknown. This current study represents the first attempt at obtaining information about the status of AIS adoption among three, four and five star rated hotels. The findings obtained from the survey about the current status of AIS use and also the extent of *ISS* helped to answer the first objective of the study. AIS can be stand-alone; however, integration with other IS in an organisation can improve usage and benefits offered by the AIS. Thus, AIS adoption and the extent of *ISS* should be viewed together in order to know the extent of AIS usage in an organisation and create a

fuller picture. In the surveyed hotels, UBS accounting is the most widely adopted among the types of accounting packages available in the market. The adoption of any brand of computerised accounting by the hotels in the survey confirmed the use of IT systems instead of the traditional manual accounting in the hotel industry. It was found that no three, four and five star rating hotels in Malaysia are using manual accounting anymore in this increasingly technological era. The findings from the interviews support those findings from the survey, as respondents agreed on the importance of computerised accounting systems in business management nowadays. They believed that an affordable AIS that suits its purposes will help run the business efficiently. To further investigate the extent of AIS use, this study focused on the sophistication of AIS and IT in the responding hotels.

The survey findings indicated that the most common technologies adopted by the hotels are accounting-based applications such as payroll, account receivables and payables. This result is consistent with previous studies in other types of organisations in other countries (e.g. Foong, 1999: Wilson and Sangster, 1992; Raymond and Magnenat, 1982). The interview respondents specified that they were more concerned about accounting related applications compared to other applications. What they needed most was the major accounting applications that are used in their daily routines. The interviews disclosed that some hotels were struggling to stay in the market, which forced them to just use basic AIS with minimum cost. However, some other big and more successful hotels did not have these problems and they provided up-to-date IT infrastructure and applications for accounting.

Another highly adopted technology revealed by the survey is the use of local area network, which is a computer network that interconnects computers within the

organisation by using the network media. The high use of this local area network shows that departments within an organisation are connected for easy communication and information transfer/sharing. The connectivity to outside communication could be possible with links using an external network. However, external networks are less adopted by the hotels in the survey, which give the impression that they are not using this medium to communicate with outside parties such as customers and suppliers within the supply chain. The interviews pointed out this problem, whereby some hotels do not have their own internet to promote their hotels. They depend on tourist agencies to hold their name and promote them in the agencies' websites. As a result, the promotion of the hotels by the agencies will be in general terms and limited because there are many hotels on the agencies' lists. The hotels also cannot deal directly with the customers because the customers will book through the agencies and this reduces the potential for personal contact. Those hotels have to compete with other hotels on the agencies' lists, which may reduce the chances of being selected by the customers.

The survey also discovered that database systems are not regarded as an important technology by the hotels. A database is an organized pool of logically-related data. Data is stored within the data structures of the database. All important data are stored in the database for the purpose of sharing the information with entire departments within the organisation. With low adoption of this technology, the hotels do not use the IS to its fullest extent, that is, to share information as much as they might and this shows scope for future development. Finally, decision support systems and related management systems are also at a low level of adoption among the hotels. A decision support system is a computer-based information system that supports business or organisational decision-making activities such as word-processing, graphics and presentation packages and spread-sheets. Related management systems, for example inventory management,

purchasing, operations planning and control helps organisations to plan and organize the business operations more efficiently and effectively; however, these are seen as less important to the hotels surveyed.

In terms of types of processing, the findings show that the batch processing type is still popular among the hotels in the survey. The key characteristic of batch processing is that all the data is collected first. For example in the payroll systems the hours worked by each employee need to be collected first. It is then entered into the system in one go (a batch of data) and processed. The gradually increasing use of online and real-time types of processing by the hotels indicated that the trend is moving towards this more advanced type of processing. Online processing means that data is processed by the system as it is entered and the user typically waits a short time for a response, for example in the hotel booking system. The real time processing is a sub-set of online processing. The data is entered and processed right away. This is done quickly, as the processing of data must be completed and produce an output in time to affect the next input. For example the stock control system in a supermarket or hotel shop operates instantaneously in reading barcodes and looking up prices.

The survey findings also revealed that the hotels make extensive use of the basic accounting modules of accounts receivable, accounts payable and general ledgers, also financial accounting and payroll. However, the hotels make less use of billing, online reservation, purchasing and inventory modules. Minimal usage is also shown of management accounting types of modules of cost accounting, budgeting, budget variances and operational planning and control. Other optional modules of financial analysis, online payment and receipting, order entry and personnel management are also at a relatively low level of utilisation. The results generated by this current study are in

line with the results obtained previously (e.g. Cragg, 1989; Montazemi, 1987; Malone, 1985), where most of the hotels adopted transaction-oriented systems to support operational and administrative tasks only.

Enquiry about the sources of software shows that the four and five star rated hotels in Malaysia are generally larger companies and thus, they are using external custom-developed software or they have a purchased package modified externally. They often have higher standard software to meet their specific requirements with regard to their hotel operations. However, a majority of three star rated hotels use standard un-modified software. Internally modified and internal custom developed software is not popular in the hotels in Malaysia, because of a lack of internal expertise to deal with such difficult tasks.

Finally, the study was also interested in the types of IT planning which revealed that, overall, few of the hotels undertake various aspects of IT planning. Financial resources planning is the most frequently undertaken by half of the hotels, followed by implementation planning and information requirement planning. Lack of IT planning by the responding hotels can generally be explained by lack of IT expertise in the organisations.

To conclude, the three, four and five star rating hotels in Malaysia are using the AIS in managing daily accounting related routines and producing accounting and management reports. However, the extent of the AIS use is still minimal with the focus more on basic accounting modules and accounting based applications. The AIS usage is to support operational and administrative tasks rather than to help in hotels high-level business decision making. The study by Law and Jogaratnam (2005) in Hong Kong hotels also

revealed similar results where IT was not fully utilized by hotel decision makers to help them in their business strategies. Overall findings from the interviews revealed that hotel companies are very much affected by the economic and financial situations, domestically and internationally. They also depend on the political stability of the country, region and globally. The support from government and other related agencies to promote the country also plays an important role in the tourism industry in general and the hospitality industry in particular. Not to be ignored is the effect of natural disasters such as tsunami, earthquakes, flood and etc. Some hotels in the survey struggle to stay in the market because of current poor economic conditions. Those hotels thus ignore the important use of technologies at the moment because they require high financial investment. This explains why some hotels just a have basic level of information system sophistication in general and AIS in particular to support them in running their business.

8.2 Discussion on Usage of and Satisfaction with AIS

The following discussion is based on the main model proposed for this current study and also other sub-tests to ensure robust results for each aspect. The main model from Chapter Six (refer Figure 6.2, p. 175) is reproduced here for the convenience of the reader.

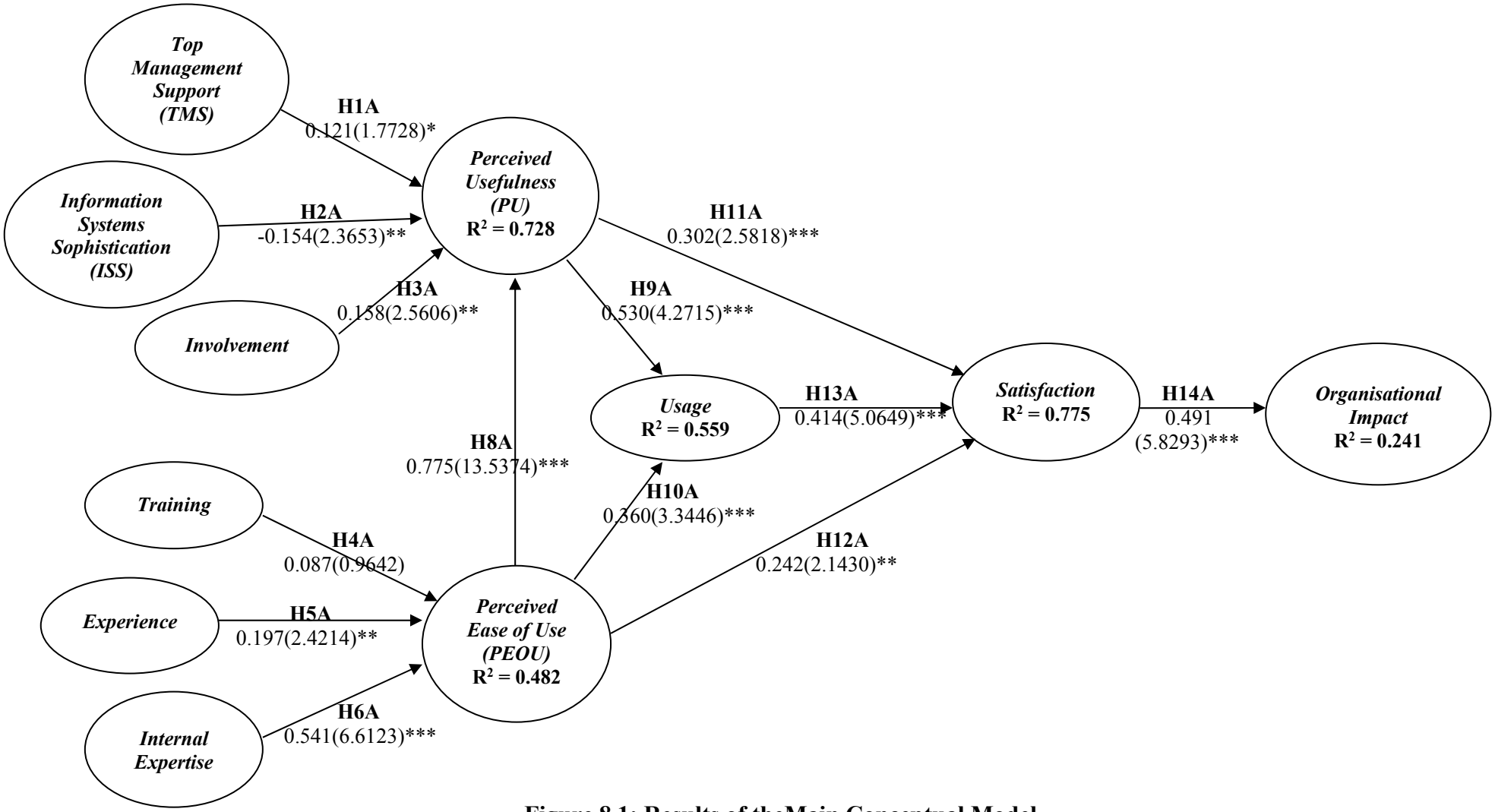


Figure 8.1: Results of theMain Conceptual Model

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.1

8.2.1 The Influence of External Factors on PU

In the main conceptual model (Figure 8.1), external factors of *TMS*, *ISS* and *user involvement* are hypothesized to directly influence *PU*. This section aims to identify the factors that contribute to the *PU* of the AIS and answer the hypotheses of (1) H1A: *TMS* is positively associated with *PU* of the AIS; (2) H2A: *ISS* is positively associated with *PU* of the AIS; and (3) H3A: *Involvement* is positively associated with *PU* of the AIS.

The results in the main model show that *TMS* only slightly influences *PU*. This outcome implies that AIS users in accounting departments cannot see a strong link between the support received from top management and *PU* of the AIS. The result is in contrast with earlier studies (e.g: Doll, 1985; Rochart and Crescenzi, 1984) when they found that top management's concern and involvement in management information system development will lead to greater system success. Even though the support from top management is regarded as a most important driver for any successful change in an organisation and lack of *TMS* was a critical barrier to IS use (Guimareas and Igbaria, 1997; Igbaria et al., 1995), in this case, it only shows a minimal effect on user's *PU*. The top management concerns about investment and performance of IT in general and AIS in particular, were not regarded as having a big impact for AIS users in accounting departments.

The findings from the interviews expanded further the role and support from the top management. Some hotels received good support and encouragement from top management to use AIS in their operations. However, because of the slowdown in their business activities, they could not afford to have the latest AIS that could serve them better. Some of the hotels had to down grade their AIS to a lower cost version, in terms of monthly payment to the vendor. These issues contribute to negative effect on the

perceptions of users regarding *PU* of the AIS. Some other hotels however, get considerable support from top management and can afford to have the best AIS that meet their requirements which promote competitive advantage. The mixed findings in the interviews explained the weak results generated in the survey for the relationship between *TMS* and *PU*.

It is noted that *ISS* (H2A) is associated with *PU* but with a negative relationship. The higher the *ISS* in a hotel, the lower will be the *PU* of AIS by the users. AIS users appear to prefer to have minimum sophistication of IS, because sophisticated and complicated IS interrupt their AIS usage. This may be explained by the relatively limited knowledge, experience and expertise of the users to handle more sophisticated software. The result of this finding on *ISS* could be combined with the insight of the extent of AIS use in the earlier discussion (section 8.1). The *ISS* is generally limited in the hotel industry and the use of IT and AIS are at a relatively basic level. Therefore these findings by this current study are not in agreement with previous reported studies where *ISS* is seen as important to successful implementation of any computerised system (Lee and Kim, 2007; Zu et al., 2003; Wixom and Watson, 2001; Cash et al., 1996). The result also shows that AIS users prefer to have their AIS as a standalone system, instead of an integrated system, another indicator of relatively low sophistication. This may reduce the overall benefits offered by the AIS because IT/IS infrastructure has been identified as another capability that can influence a firm's ability to use IT strategically (e.g.: Sambamurthy et al., 2003; Armstrong and Sambamurthy, 1999; Broadbent et al., 1999; Ross et al., 1996).

The respondents in the interviews shared their views with regard to *ISS*. Some of them preferred to have non-integrated system, that means that the AIS in the back office as a standalone system and separated from other IS systems in the whole hotel operations.

Theyoften chose to have a standalone system because of a lack of IT staff to support the system and the critical consequences of any breakdown. Some other hotels used an integrated system; however, it was often not fully utilised by the hotels because of a lack of expertise to deal with this sophistication. Thus, the decision to have an integrated system or a more sophisticated IS should occur together with enough IT/AIS expertise and support to utilise it effectively. In the situation of hotel companies in Malaysia, they seem to lack of this expertise, which has resulted in a minimum *ISS,* engaging only basic accounting operations.

The results of the main model (Figure 8.1) also revealed that *involvement* (H3A) has a strong positive direct effect on *PU*. Users' participation in the AIS development process is an indicator of higher *PU* of the AIS. The high influence of *involvement* on *PU* supports the traditionally held assumption that *involvement* is a major factor in systems' success. This result is further support for the positive relationship between *involvement* and systems success found previously (e.g.: Rouibah et al., 2009; Rondeau et al., 2006; Kujala, 2003; Bekker and Long, 2000; Wilson et al., 1997). Hotels which involved AIS users in the development of the AIS would find better *PU* of the system by the users. The findings in the survey are fully supported by the results of the interviews. In the hotels where the staff had been involved in the development of the AIS, they declared they were more satisfied with the AIS, which served their needs better and they used it to a greater extent. In contrast, where hotels did not involve their accounting staff in the AIS development, respondents were found to be less satisfied with the system and declared that 'they just use the AIS because they have no other choice'.

Apart from the three external factors mentioned above, *PEOU* is also hypothesized to impact *PU*. The hypothesis H8A: *PEOU* is positively related to *PU* is shown in the

main model. This resulted in a highly significant influence on *PU* with a positive direct relationship. This result strongly supports Davis (1989) when he claimed that *PEOU* was a causal antecedent to *PU*. The result also supported Igbaria et al. (1995), where they revealed that *ease of use* is strongly correlated with *PU*. Gefen and Keil (1998) also found that *PEOU* directly affected *PU* in the case of developer responsiveness to use of IS. Those earlier studies were supported by more recent studies (e.g.: El-Gayar and Moran, 2007; Saade and Bahli, 2005: Wang et al., 2003; Selim, 2003; Brown, 2002; Hong et al., 2002; Gefen and Straub, 2000). All the four variables of *TMS*, *ISS*, *involvement* and *PEOU* contributed to R^2 value of 0.728, which means that the four variables help to explain 72.8% of variance of *PU*.

In sub-test 2 (Figure 6.5, p. 189), the *PEOU* was removed from the construct to influence *PU* and this resulted in *TMS* (H1C) and *involvement* (H3C) being shown to highly influence *PU* with positive relationships. However, in this sub-test 2, the *ISS* (H2C) became not significant to impact *PU*. With only three variables of *TMS*, *ISS* and *involvement*, the R^2 value of *PU* was only 0.276, which means that *TMS*, *ISS* and *involvement* were only able to explain 27.6% of variance of *PU,* a significant decline from the earlier finding. This revealed that the highest contribution of variance to *PU* is from *PEOU*. Or in other words, *PEOU* is the strongest predictor of *PU* among all the variables (Davis et al., 1989).

In the main model, when the AIS users perceived AIS is useful to them because AIS is easy to use, *TMS* only has a minor influence over *PU*. However, in sub-test 2 (Figure 6.5, p. 189) when *PEOU* is not a determinant of *PU*, *TMS* becomes an important factor to influence the user's *PU*. This implies that, formal or informal support from *top management* and this could influence the acceptance and *usage* of a system. Without

PEOU, users are influenced, more by the support from top management, to accept and *use* the system. In the main model also, *ISS* is shown to only slightly influence *PU* at a negative relationship. It changes to totally not significant without *PEOU* as a determinant to *PU* in sub-test 2 (Figure 6.5, p. 189). This suggests that hotel users believe *ISS* cannot help them if they think AIS is not easy to use. If a system is not easy to use, they have various problems to handle it, and thus they believe it cannot help them in their job. If they perceive the systems are difficult to deal with, they do not appreciate the systems, and rather avoid using them. However, *involvement* in sub-test 2 (Figure 6.5, p. 189) remains the same with or without *PEOU* as a determinant of *PU*. *Involvement* has still a strong influence on *PU*. This shows the importance of users' *involvement* in the development process of the AIS.

In sub-test 4 (Figure 6.7, p. 195), *training* (H4E) is hypothesized to influence *PU* and it resulted in a strong positive relationship. The existence of *training* in the construct improves the relationship of *ISS* (H2E) on *PU*, but it is still negative. The implication of this result is that, when users have enough *training*, their *PU* of AIS increases because it becomes clear to them what the system can offer to improve their job and their efficiency. They prefer to use an AIS without too much sophistication, that makes it complicated to use. The training provided to users might be limited only to the use of the AIS and not to deal with the overall IS that is available in the hotel. Perhaps users cannot see the benefits offered by *ISS* to improve their AIS capabilities. In the same sub-test 4 model, the incorporation of *training* removed the importance of *TMS* (H1E) to influence *PU*. The users manage to handle AIS better after the training, and thus they do not appreciate other direct or indirect efforts from the *TMS* such as investment made by the top management to have latest IS technology. Therefore *TMS* may only indirectly

influence *PU* through *training* because the decision to provide training is from the top management since the training is expensive and a senior management decision.

Appendix 5 provides more sub-tests to explore still further the robustness of the results related to the relationship between external factors and *PU*. The tests in the appendix found no significant impact for relationships between *experience* and *PU* (H5H); and *internal expertise* and *PU* (H6J). Users' computer experience does not significantly impact *PU* in the case of AIS. A study by Igbaria et al. (1997) revealed that computer experience has an indirect effect on *PU* through *PEOU*. Lack of internal expertise could result in a lower level of awareness of new technologies and understanding about the importance of IT. However, in this current study, *internal expertise* is not a significant influence on *PU*. Knowledge, skills and *experience* about the AIS could only indirectly influence *PU* through *PEOU*.

The summary results of all the tests (Table 8.1) regarding the factors that influence the *PU* of AIS in the hotel industry show that the main variable to influence *PU* is *PEOU*. Other important factors that can impact the users' *PU* of AIS are *involvement* of the users in choosing, modifying or providing information about the input or output required to/from the AIS. *Training* also helps in improving *PU* of AIS. *ISS* is surprisingly not appreciated by the AIS users in this case, because the more sophisticated the IS in a hotel, the more problems might be faced by the AIS users in dealing with the whole IS. *TMS* is shown to be only slightly important in influencing *PU*. User's *experience* and *internal expertise* failed to significantly impact *PU*.

Table 8.1: Summary of results for PU

			PU					
Model	**TMS**	**ISS**	**INV**	**PEOU**	**TRN**	**EXP**	**IE**	**R^2**
Main (Figure 6.2)	Low (+ve)	Medium (-ve)	Medium (+ve)	Strong (+ve)	-	-	-	72.8%
Sub-test 2 (Figure 6.5)	Strong (+ve)	n.s	Medium (+ve)	-	-	-	-	27.6%
Sub-test 3 (Figure 6.6)	-	Low (-ve)	Strong (+ve)	Strong (+ve)	-	-	-	72%
Sub-test 4 (Figure 6.7)	n.s	Strong (-ve)	Medium (+ve)	Strong (+ve)	Strong (+ve)	-	-	77.1%
Sub-test A (Figure A6-1)	n.s	-	Medium (+ve)	Strong (+ve)	-	-	-	71.2%
Sub-test B (Figure A6-2)	Medium (+ve)	Low (-ve)	-	Strong (+ve)	-	-	-	70.9%
Sub-test C (Figure A6-3)	Low (+ve)	Strong (-ve)	Strong (+ve)	Medium (+ve)	-	n.s	-	74%
Sub-test D (Figure A6-4)	n.s	Medium (-ve)	Medium (+ve)	Medium (+ve)	-	-	n.s	72.2%

8.2.2 The Influence of External Factors on PEOU

In the main proposed conceptual model the three external factors of *training*, *experience* and *internal expertise* were hypothesised to directly influence *PEOU*. The results generated within this section will summarise the factors that contribute to the *PEOU* of the AIS. In the main model (Figure 8.1). The hypotheses related to *PEOU* are (1) H4A: *Training* is positively associated with *PEOU*; (2) H5A: *Experience* is positively associated with *PEOU*; and (3) H6A: *Internal expertise* is positively associated with *PEOU*.

The results generated from the main model show that *training* was found not to significantly impact *PEOU* and thus hypothesis H4A is rejected. The result is very much at odds with previous studies (e.g.: Larsen, 2009; Hartono et al., 2007; Al-Gahtani, 2004; Compeau et al., 1995),which pointed out that training results in changes in users' perceptions of the relevance IS and is a critical intervention in order to ensure successful implementation of IS. Nelson and Cheney (1987) found a positive relationship between computer-related training and computer-related ability, which then

led to the acceptance of IS. In the case of AIS in the hotel industry in this study, training received by the AIS users failed to improve their interaction with the system. The training however, helps the users to see that the system is useful to them (as observed earlier in section 8.2.1). The situation may be best explained by the fact that the AIS usage is not the same as the usage of other types of IS such as the internet, decision support systems, office automation and so on. The use of AIS requires the users to have knowledge about basic computer work and also a good grounding in accounting. The training might tell them about greater potentiality offered by the system in dealing with accounting matters. Thus, the users might see more usefulness rather than ease of use from the training they received. Training might also be limited to the use of AIS only, whereas, the AIS is only a small part of the whole IS in a hotel. If the users cannot see a clear picture of the interface of AIS with the whole IS, they may still find AIS not easy to deal with. Training should not only focus on the use of AIS but also on other IS available in the hotel.

The interesting findings about training in the survey could be explained by the findings from the interviews. Respondents in the interviews shared their views about training in their organisations. It seems that IT/IS training is not a priority to the hotels even after they undertake considerable investment to acquire the technologies. Some hotels only have external training for a few days and some employees are more fortunate to have longer training from the vendors. Some hotels cannot afford to provide external training to their staff at all. In most of the hotels, only internal training between staff are available, especially to a new-comer without experience of the system. The lack of training in the surveyed hotels is related to the cost to be paid to the vendors. The hotels could not afford to pay vendors to provide training to the staff. Training thus seems to

be ignored by senior hotel management as an important factor to improve the usage of the system.

The results from the main model also revealed that *experience* (H5A) with previous AIS, positively influences the respondents *PEOU*. That is, either the users were using the same AIS previously, or there were different types of AIS. However, their experience seems to help them in dealing with any AIS. The findings are in support of the previous studies (e.g.: Liaw and Huang, 2003; Agarwal and Prasad, 1999; Igbaria et al., 1995; Thompson et al., 1994) as they suggested that users with computer *experience* were more at ease when participating in any IS activities. Previous studies also pointed out that a user's computer experience directly affects their satisfaction with IS (e.g.: Venkatest et al., 2008; Thong et al., 2002; Nelson and Cheney, 1987; Lee, 1986). Almost all the respondents in the interviews reported experience with different brands of AIS and they found it helps them a lot in dealing with their current AIS. They also agreed that previous experience with IT or AIS could give more users confidence to handle computer applications better and with ease.

Internal expertise (H6A) is shown to significantly influence *PEOU* with a direct positive relationship. When users have enough expertise in using a system, they would find it easy to manage the system. Internal expertise is important because AIS is a complex system requiring both technical knowledge about IS and accounting. Not only do accounting users have to be proficient at using AIS, IT staff should also able to support the AIS users when required. Without IT expertise, hotels may be reluctant to invest in new technologies because of uncertainties and risks concerned with developing advances in the systems. AIS users in the survey agreed that their own expertise at using the AIS and sufficient support received from IT staff enables them to handle the system

with ease. The result in this study supports previously reported findings (e.g.: Yap et al., 2003; Ziefle, 2002; Davis, 1994; Ye and Salvendy, 1994) that stressed the importance of IT expertise for handling technical systems.

The interviews provide greater insight about the importance of internal expertise for managing the AIS. All accounting staff should be able to use AIS, however, in some hotels, staff failed to take advantage of all that is offered by AIS. The problems faced by the department were shared with the interviewer by accounts managers who were dissatisfied with the performance of the staff. Without experience with the system, those staff cannot manage their responsibilities and this affects the efficiency of the whole department. The managers in those hotels realised the importance of expertise when dealing with computer systems. In some of the other hotels with integrated systems, the problems were far more serious, IT support staff failed to provide services needed. Interviewees revealed that the management depend on vendors to settle their problems which sometimes take time to resolve because of their distance from the vendors. The respondents from those hotels agreed about the important roles played by internal expertise to provide immediate service when problems occurred. However, the respondents from big and established hotels were relaxed because they have enough expertise from accounting people as well as from IT support staff. They do not have problems in handling technical systems in the hotels. Overall, the interviews revealed that, some of them are satisfied with the performance of the staff; however, other found trouble with the lack of internal expertise in dealing with the systems.

All the three external factors of *training*, *experience* and *internal expertise* contributed to R^2 value of 0.482 applicable to *PEOU*. It shows that 48.2% of the variance of *PEOU* is explained by those three factors. In sub-test 2 (Figure 6.5, p. 189), *PU* (H8C) is

hypothesised to influence *PEOU*. This resulted in a strong positive relationship between *PU* and *PEOU*. It implies that AIS users who perceive AIS is *useful* would also perceive it as *easy* to deal with. By adding *PU* into the construct the R^2 value of *PEOU* has increased to 0.723, thus revealing that the four variables of *training*, *experience*, *internal expertise* and *PU* better explain the variance of *PEOU*. It also shows that *PU* is the strongest factor to explain *PEOU*, given the factor improves the R^2 value by 24.1% (72.3% - 48.2%).

Sub-test 3 (Figure 6.6, p. 192) explored the placing of *TMS* (H1D) to impact *PEOU*, however the result was found to be insignificant. In this case, it appears that the users cannot relate the role *TMS* with the *PEOU*, for example, *TMS* effort in deciding in what order AIS should be implemented and *TMS* concern about the performance of AIS operation. All those actions taken as part of *TMS* were not seen as directly helpful to users *PEOU* in the case of AIS in the hotel industry.

In Appendix 5, more tests were undertaken to attempt to improve explanation for *PEOU*. However, the tests resulted in non-significant results for relationships between *ISS* and *PEOU* (H2F); and *involvement* and *PEOU* (H3G).

From the literature reviews, *external expertise* was hypothesised to influence *PEOU* which was H7A: *external expertise* is positively associated with *PEOU*. This can be found in the original proposed model (Figure 2.12, p. 49). However, the e*xternal expertise* (construct variable) failed to fulfil the requirements of reliability and validity in the measurement model of Chapter Five. It was thus withdrawn from the model. In previous studies (e.g.: Thong et al., 1994, 1993; Yap et al., 1992; Gable, 1991) it was noted that external expertise was an important factor contributing to IS effectiveness.

There were studies (Ifinedo, 2008; Ko et al., 2005; Gefen, 2004; Green and Ridings, 2002) about the impact of external expertise on enterprise resource planning (ERP) systems and these studies found a very strong positive relationship between external expertise and ERP success. The effect of external expertise could not be tested in this current study; however, it does provide scope for future research.

The interviews revealed that the hotels do not have close relationships with consultants and government agencies. Therefore they were not depending on those two sources in their hospitality operations. A small number of hotels outsource the accounting functions to local accounting firms and thus these hotels relate more strongly with the accounting firms. A majority of the hotels, however, do not outsource their accounting functions and therefore do not seek help from accounting firms except with the annual audit. Almost all hotels depend very much on vendors or dealers for IT support but some of them are not satisfied with the services provided by the vendors because of their distance from the vendor and the slow response time. Some of them also cannot afford to pay high fees charged by the vendors and they do not call for vendors if anything happens to the system. The findings from interviews provide clearer understanding about external expertise to hotels in the survey. External expertise is not regularly sought by the hotels in the survey with regard to their IT/IS in general and AIS in particular. External expertise is not an important factor to impact ease of use of AIS in the hotel industry and thus is rejected as one of the factors in the *PEOU* construct.

To summarize the results generated within this section (Table 8.2), only three factors are observed to significantly influence *PEOU*, namely, *experience*, *internal expertise* and *PU*. Among the three factors, *PU* is the strongest predictor of *PEOU*.

Table 8.2: Summary of results for PEOU

PEOU								
Model	**TRN**	**EXP**	**IE**	**PU**	**TMS**	**ISS**	**INV**	**R^2**
Main (Figure 6.2)	n.s	Medium (+ve)	Strong (+ve)	-	-	-	-	48.2%
Sub-test 2 (Figure 6.5)	n.s	n.s	Strong (+ve)	Strong (+ve)	-	-	-	72.3%
Sub-test 3 (Figure 6.6)	n.s	Medium (+ve)	Strong (+ve)	-	n.s	-	-	48.4%
Sub-test 4 (Figure 6.7)	-	Medium (+ve)	Strong (+ve)	-	-	-	-	47.7%
Sub-test A (Figure A6-1)	n.s	Medium (+ve)	Strong (+ve)	-	-	n.s	-	48.7%
Sub-test B (Figure A6-2)	n.s	Medium (+ve)	Strong (+ve)	-	-	-	n.s	48.4%
Sub-test C (Figure A6-3)	n.s	-	Strong (+ve)	-	-	-	-	45%
Sub-test D (Figure A6-4)	Strong (+ve)	Strong (+ve)	-	-	-	-	-	28.3%

8.2.3 The Influence of PU and PEOU on Usage

In this study, *PU* and *PEOU* are both hypothesised to positively impact *usage* of AIS. The hypotheses were (1) H9A: *PU* is positively associated with *usage* of the AIS; and (2) H10A: *PEOU* is positively associated with *usage* of the AIS. The results are presented in the main model (Figure 8.1) where both are revealed to highly influence *usage* of AIS with positive direct relationships. *PU* and *PEOU* contributed to an R^2 value of 0.559, that is 55.9% of variance in the *usage* of AIS is explained by the two variables. Thus, logically, when users perceive AIS is useful and is easy to use, the usage of AIS is high. In a situation where AIS is perceived useful, the usage of AIS is extensive because users depend on the AIS and believe that AIS will help them to perform better and be more efficient in their job. *PU* has a stronger effect on *usage* of AIS compared to *PEOU* (higher beta coefficient). This is closely in agreement with Davis et al. (1989) when they pointed out that *PEOU* is a significant secondary determinant of people's intentions to use computers, after *PU*. The explanation is related to time. In the early stages of using AIS, ease of use is a major determinant of AIS *usage*. However, over time, when the users have more experience with the AIS, the

significance of *PEOU* will tend to decrease and the significance of *PU* will increase. This result is in line with previous research generated by Hong et al. (2002), Gefen and Keil (1998) and Igbaria et al. (1997).

The results from the interviews fully supported the findings from the survey. The interview respondents stressed the importance of AIS in their job. The nature of business nowadays requires them to have an accounting system that could support the hotel operations. In competitive markets, businesses need to make fast decisions to beat competitors and remain successful. Thus, any computerised systems in which the businesses invest should be compatible with the business operations. The respondents in the interviews believed that AIS could provide the business with a competitive advantage and enable them to be effective and efficient in managing their tasks. They are very much dependent on the AIS and believe the AIS is very useful in their job. They also found ease at using the AIS which make their job more straightforward. Some of them were using system which was customised by the hotels and some others had enough experience and support for the AIS.

In this study, external factors were hypothesised to indirectly impact the *usage* of AIS through *PU* and *PEOU*. In the main model, *TMS*, *ISS* and *involvement* were hypothesised to indirectly influence AIS *usage* through *PU,* whilst, *training*, *experience* and *internal expertise* were hypothesised to indirectly impact the *usage* through *PEOU*. At the same time, *PEOU* was a causal antecedent to *PU* as also claimed by Davis (1989). This direction of *PEOU* to *PU* was changed in sub-test 2 (Figure 6.5, p. 189) by examining the impact of *PU* on *PEOU*. This change affected the relationship between *PEOU* and *usage*, where their previously strong relationship was reduced to a modest

level only. There is, therefore, no way to improve the relationship hypothesised in the original model.

Several studies have examined the link between *usage* and *satisfaction*, including the possibility of causality in either direction (Lee et al., 2009; Rouibah and Hamdy, 2009; Anandarajan et al., 2002; Al-Gahtani and King, 1999). In sub-test 1 (Figure 6.3, p. 184), *satisfaction* was placed as a dependent variable of *PU* and *PEOU* and all these preceding *usage*. The hypotheses (1) H9B: *PU* is positively associated with *satisfaction* with the AIS; and (2) H10B: *PEOU* is positively associated with *satisfaction* with the AIS, were tested. It resulted in highly significant positive relationships between *PU* and *satisfaction*; and between *PEOU* and *satisfaction*. *PU* and *PEOU* both contributed to an R^2 value of 0.708 for *satisfaction*, which suggests that 70.8% of variance in *satisfaction* is explained by *PU* and *PEOU*. The results thus concluded that *PU* and *PEOU* best explained *satisfaction*, compared to *usage* in terms of the AIS. That is, AIS users are *satisfied* with the system when they believe that AIS could increase their performance and productivity.

In the above case, *satisfaction* with the AIS precedes *usage*. In measuring satisfaction with the AIS, it is about perceived benefits, about what the users could get from the *use* of a system, and not about the usage itself. AIS could be a failure, not because it is not being used but because it does not provide benefits to users. In this case, positive belief about *PU* and *PEOU* could result in satisfaction with the AIS because of what the users' believe about the benefits offered to them by the AIS.

Usage			
Model	**PU**	**PEOU**	**R^2**
Main (Figure 6.2, p.175) In this test, *PEOU* is a determinant to *PU*	Strong (+ve)	Strong (+ve)	55.9%
Sub-test 2 (Figure 6.5, p.189) In this test, *PU* is a determinant to *PEOU*	Strong (+ve)	Medium (+ve)	55.9%

Table 8.3: Summary of results for impact on usage

Satisfaction			
Model	**PU**	**PEOU**	**R^2**
Sub-test 2 (Figure 6.3, p.184) In this test, *PEOU* is a determinant to *PU*	Strong (+ve)	Strong (+ve)	70.8%

Table 8.4: Summary of results for impact on satisfaction

Tables 8.3 and Table 8.4 summarize the results generated about the effect of *PU* and *PEOU* on *usage*; and *PU* and *PEOU* on *satisfaction*. Even though the results revealed that *PU* and *PEOU* are better determinants of *satisfaction* compared to *usage*, the next section will provide further discussion on this matter. The reasons for the current study proposing *PU* and *PEOU* are better placed as determinants of *usage* in the main model will be dealt with in the next section.

8.2.4 The Influence of PU, PEOU and Usage on Satisfaction with the AIS

This section aims to examine the causal factors influencing *satisfaction* with the AIS. In the main model (Figure 8.1), it was hypothesised that (1) H11A: *PU* is positively associated with *satisfaction* with the AIS; (2) H12: *PEOU* is positively associated with *satisfaction* with the AIS; and (3) H13: *Usage* of AIS is positively associated with *satisfaction* with the AIS. The results of the main conceptual model are now referred to further, to discuss the results. *PU* was found to strongly, positively and directly influence *satisfaction*. That is, AIS users were satisfied with the system when they perceived it useful in their job. They are dependent on AIS to perform their job effectively and efficiently. The model also tested *PU* to indirectly influence *satisfaction*

through *usage*. The result was also positive and significant. For users who perceived AIS as useful, their usage is high, and it then contributes to users' satisfaction with the system. The same results were also generated from *PEOU*, it was found to directly influence *satisfaction* with a positive relationship. *PEOU* was also shown to indirectly impact *satisfaction* through *usage* at a significant level. Hence, when users perceive AIS to be easy to deal with, they use it and they are satisfied with the system.

The interviews revealed that, users were dependent on AIS. They get what they need from the system and they are satisfied with the AIS they are using, exceptionally there was some difficulties faced by certain hotels which struggle in the bad economic conditions at that time. Those hotel managers who cannot afford to have a better system still appreciate the system they have. The system they are using is still much better than manual accounting. The interview respondents also shared their *experience* with the AIS. Even though users had problems becoming skilful at using AIS in the beginning, over time, they found it easier and were latterly able to manage the AIS. A majority of them believed that they fully utilised the system and had become more satisfied with the performance of the system.

The three variables of *PU*, *PEOU* and *usage* contributed to an R^2 value of 0.775 for *satisfaction*. That is, 77.5% of the *satisfaction* with the AIS can be explained by those three factors, hence they can be considered as good determinants. It can be concluded that, in the case of AIS in the hotel industry, *PU*, *PEOU* and *usage* are very important factors to determine AIS *satisfaction*. The result supported the findings of Livari (2005) as he found that *usage* was a significant predictor of *satisfaction*. Table 8.5 summarises the results for *satisfaction* with the AIS.

Satisfaction				
Model	**PU**	**PEOU**	**Usage**	**R^2**
Main (Figure 6.2, p.175) In this test, *PEOU* is a determinant to *PU*	Strong (+ve)	Medium (+ve)	Strong (+ve)	77.5%
Sub-test 2 (Figure 6.5, p.189) In this test, *PU* is a determinant to *PEOU*	Medium (+ve)	Medium (+ve)	Strong (+ve)	77.5%

Table 8.5: Summary of results for satisfaction with the AIS

In sub-test 1 (Figure 6.3, p. 184) *satisfaction* was changed to be a dependent variable of *PU* and *PEOU* and to precede *usage* as already explained in section 8.2.3. In this test, *PU* and *PEOU* are not shown to be significant to directly influence *usage* as shown in Table 8.6. In this sub-test 1 also, both *PU* and *PEOU* were hypothesised to indirectly influence *usage* through *satisfaction*. It resulted in a strong relationship to *satisfaction*, which then leads to *usage*. The R^2value of *usage* becomes 0.696 which means that direct influence from *satisfaction* and indirect impact from *PU* and *PEOU* through *satisfaction* explained 69.6% of variance of *usage* of the AIS.

Usage				
Model	**PU**	**PEOU**	**Satisfaction**	**R^2**
Sub-test 1 (Figure 6.3, p. 180) In this test, *PEOU* is a determinant to *PU*	n.s	n.s	Strong (+ve)	69.6%

Table 8.6: Summary of results for usage of the AIS

To conclude the results of the tests run within this section, the main model provided the strongest links among the constructs compared to the alternative models in sub-test 1 and sub-test 2. In the main model: (1) *PEOU* is a determinant of *PU*, which is preferred rather than *PU* as a determinant of *PEOU* (as in sub-test 2, p. 189). The relationship between *PEOU* and *usage* is better in the main model; and (2) *usage* as a dependent variable of *PU* and *PEOU* which then lead to *satisfaction*, is better than *satisfaction* as a dependent variable to *PU* and *PEOU* which lead to *usage* (sub-test 1).

To further explain point number (2) above, the aim of this study is to look at the impact of using the AIS. Without the actual use of the AIS, the benefits offered by the AIS could not be realised. If the AIS is used extensively but no benefits could be gained from the usage, the users will not be satisfied, and thus no impact will be given by the AIS to individuals or organisations. These issues have received considerable attention in the literature. Seddon (1997) argued that use of a system must precede the impacts of using it; however, usage of the system does not cause the impacts. DeLone and McLean (2003) rejected this idea of Seddon (1997) by claiming that system usage is an appropriate measure of system success in most cases. This current study agreed with the premise of DeLone and McLean (2003), that usage of a system could be a measure for system success in certain conditions. The actual use of a system could determine whether the system benefits the users for their intended purposes or not. Lucas (1975) observed that unused systems are a failure. Thus, extensive use of a system is an indicator of success. However, Szajna (1993) disagreed with this assumption. Seddon (1997) however, argued that the factor for IS measurement is not the system use, but the net benefits that should flow from its use. He also claimed that a system is a success if it provides benefits such as being able do more or better work in the same time than without the system, or users take less time to achieve as much work of the same quality than without the system.

In sub-test 1 (Figure 6.3, p. 184), even though *PU* and *PEOU* determine *satisfaction* better than *PU* and *PEOU* determine *usage* (in the main model), *PU* and *PEOU* were shown to be not significant to influence *usage* in this test. *PU* and *PEOU* only indirectly impact *usage* through *satisfaction*. Therefore, *satisfaction* precedes *usage* in sub-test 1, whilst *usage* cannot be regarded as an acceptance of a good system in a mandatory[2]

[2]The use of AIS by users in the hotels is mandatory because users have no choice but to use the system chosen by the top management in order to fulfil the requirements of financial reporting.

situation such as with AIS in hotel industry. Usage therefore should precede *satisfaction* to be a better measure of the AIS. From actual *usage* of the AIS, users could decide whether AIS benefits them or not; they can be satisfied or not satisfied with the AIS. Thus, the links provided by the main model is the best to measure the acceptance of and satisfaction with the AIS in this case.

8.2.5 The Influence of Satisfaction with the AIS on Organisational Impact

To explore the relationship between AIS *satisfaction* and its *organisational impact* is also an objective of this current study. Clarifying the relationship between IT usage and *organisational impact* is an important area of inquiry in IS research. It remains an on-going research topic because that relationship is complex and multifaceted. In order to fill the gap in the literature, this current study hypothesised that, H14: *Satisfaction* with the AIS is positively related to *organisational impact*. According to DeLone and McLean (1992), research into a system's success has been mostly measured in terms of systems *usage* and user *satisfaction,* though not entirely restricted to such measures. Previous studies have shown that IT may indeed be shown to contribute to the improvement of *organisations* (e.g.: Deveraj and Kohli, 2003; Hitt and Brynjolfsson, 1996). This current study reported in the main model (Figure 8.1) that, *satisfaction* with the AIS has a strong positive relationship with *organisational impact*. *Satisfaction* with the AIS explained about 24.1% of variance of the *organisational impact*. This shows the importance of satisfaction with the AIS in the context of the hotel industry in Malaysia. The users' satisfaction with the AIS could positively impact the hotels operations and performance. The result supports the statement made by Winston (1997) when he claimed that hotel operations need IT crucially and thus IT development is very important for effective hotel operations in the 21st century. IT in general and AIS in particular could improve productivity, improve operational efficiency, reduce costs and

enhance service quality of a hotel. The result obtained by this current study is also in line with previous studies (e.g.: Cho and Olson, 1998; Clemons, 1986; Porter, 1985; McFarlan, 1984) when they found a positive influence of the use of IT and the development of competitive advantage for the hospitality industry.

In the main model, *PU*, *PEOU* and *usage* were also hypothesised to indirectly influence *organisational impact* through *satisfaction*. All the three variables were seen to strongly influence *satisfaction,* which leads to improve its *organisational impact*. It appears that AIS users perceived AIS as *useful* and *easy to use*, and at the same time they use AIS extensively, or the AIS is major in their job, they are then satisfied with the AIS, because AIS could benefit them. Thus, this leads to overall performance improvement in their organisation.

In the interviews, some respondents viewed AIS to indirectly affect performance of the hotels as a whole. The performance factors of service quality, operating performance, customer loyalty, sales growth, operating costs and overall performance of the hotels were all identified. They believe that the output from the AIS is important in management decisions making. However they did not see the use of those AIS reports or output as directly related to the performance factors listed. The importance of the reports produced by AIS, however, could indirectly impact performance of the hotels. Some other respondents also believed that AIS helped to reduce operating costs in the long run, as fewer staff were needed to handle tasks which were taken over by the AIS. They also believed that, if AIS is integrated with other IS and is utilised well, hotels could be run more efficiently. The overall AIS and IS used in the hotels could possibly directly impact the performance of the hotels in such a case.

In sub-test 1 (Figure 6.3, p. 184), *usage* was hypothesised to directly influence *organisational impact*. It resulted in a strong positive relationship. However, *usage* only explained about 15.1% of the variance of *organisational impact* compared to 21.4% by *satisfaction* in the main model. In sub-test 1 also, *PU* and *PEOU* were shown to be not significant in influence upon *usage*. Users *PU* and *PEOU* about the AIS did not influence *usage* of the AIS in this case. Thus *PU* and *PEOU* failed to indirectly influence *organisational impact* through *usage*. Only *satisfaction* indirectly influenced *organisational impact* through *usage*.

To conclude, *satisfaction* with the AIS is a stronger influence on *organisational impact* compared to *usage* of the AIS. *Usage* of the AIS cannot determine whether the system could actually fulfil the needs by the users. It is important to consider the nature, extent, quality, and appropriateness of the system use by measuring the satisfaction with the AIS after the usage. In terms of IT in general and AIS in particular, one cannot simply say that the usage of a system could yield more benefits. AIS could benefit the users if the users are satisfied with the AIS, which means that, the AIS could do what users expect it to do. This current study found *satisfaction* with the AIS is a better determinant of *organisational impact* in the case of hotel industry in a Malaysia. Table 8.7 summarizes the results for *organisational impact* from *satisfaction* and *usage*.

Organisational impact			
Model	**Satisfaction**	**Usage**	**R^2**
Main (Figure 6.2, p. 175)	Strong (+ve)	-	24.1%
Sub-test 1 (Figure 6.3, p. 184)	-	Strong (+ve)	15.1%

Table 8.7: Summary of results for organisational impact

8.3 Summary of the Chapter

This chapter discussed the results generated in Chapter Six for the survey and Chapter Seven for the interviews. The combination of the findings from the survey and interviews aimed to achieve the research objectives and answer the research questions. In the triangulation, the findings from the interviews were used to support the findings from the survey. Further implications from those findings and conclusions to the current study will be discussed in the next chapter.

CHAPTER NINE
Conclusion

9.0 Introduction

This chapter will consider the implications of the results obtained. It will discuss the originality of the study which is an important aspect of concern. It will also address the limitations of the study and possible areas for future research.

9.1 Implications of the Research

This study is about the usage of and satisfaction with AIS. It updates earlier studies regarding the acceptance of IT and IS and system satisfaction, which have received considerable attention from researchers. It should be noted that this study specifically addresses accounting information systems (AIS) rather than the broader IS which is often researched. It also provides new findings about the study of AIS in a developing country (Malaysia), which has been given less attention compared to developed countries. The study should encourage researchers to consider any part of the world as a potential location for research to test and enrich standard technology adoption theories. It further provided a new insight for AIS in the hotel industry, an important sector in Malaysia where little research had been undertaken previously.

The study examined a conceptual model of AIS usage and satisfaction that was based on both theory and prior empirical findings. There are several theoretical and practical implications in this research. From the standpoint of user acceptance research, this work adds to the body of research on TAM. The study also contributed to hotel industry literature and accounting literature by expanding our understanding of factors influencing usage of and satisfaction with AIS in hotel companies. One of the most fundamental strengths of this research is that it was conducted among business professionals (while it has typically been tested in the past using students; e.g.:

Venkatesh and Davis, 2000; Taylor and Todd, 1995; Davis et al., 1989). Research of the TAM has led to various applications and successful replications. The findings from this study will contribute to existing literature within the area.

From a managerial standpoint, the results of this study can inform managers in hotel companies about the factors that may possibly contribute to users' *PU* and *PEOU*, which will then lead to improved usage of AIS in their hotel operations. Managers can determine the factors that will assist companies to avoid implementation pitfalls and gain the potential benefits of the AIS. The findings from this study could be used by hotel managers to govern the feature of AIS user satisfaction and assist them to develop appropriate intervention practices and processes aiming to increase user satisfaction. Additionally, they could periodically evaluate the satisfaction factors, benchmark the results with the expected satisfaction levels, diagnose which factors are problematic and need further consideration.

The main model and the various sub-tests models provide checks on the robustness of the results to compare and combine factors for the best outcomes. The results confirmed a strong direct effect of PU on usage. This implies that the functionality of the AIS must be emphasized to potential users. The models determine that, in terms of PU, the focus should be given initially on (1) involvement of the users in the system development; (2) training; and (3) ease of use with the AIS. Software developers must address usefulness and ease of use as an important design objective when developing the AIS. It is, for example, important to consider involvement during pre-implementation processes which was found to contribute to PU. The specific operational needs, business drivers, strategic plans and other factors that define the scope and objective of the AIS should be identified during the process. The accountant and accounting managers should play their

role during this phase because they will use the system and know better than others in the organisation about the AIS and its requirements. They should also be aware of the needs of the uses of the accounting reports however, because, whilst some of the accounting outputs are mandates, others are optional and should be developed to meet managerial needs.

For hotel managers, efforts should not only be aimed at adopting the latest technologies, but also at improving system acceptance at the individual employee level. Organisation wide support is important, especially in terms of training programmes. Training programmes should be used to emphasize the benefits of using the AIS. The study revealed that training is crucial for staff in hotel companies in Malaysia. The hotels avoid providing training to staff because of its cost. The training cost could be low and yet achieve a successful outcome by identifying the areas in which the training is most needed by staff, which would be highly beneficial. Training courses could be customised based on individual users' need, skills and competencies. They could also adopt flexible training methods for innovative e-learning techniques such as computer-based training, web-based virtual classrooms, and DVD training applications enabling users to receive training on demand. The investment in formal training could be limited and yet the AIS could be implemented and operated effectively. The managers should also choose the AIS that serves its purposes and simplified the system design for ease of use of the system.

PEOU also has a direct effect on *usage*. This suggests that efforts to improve *PEOU* could have a strong influence on *usage* of the AIS in the hotel companies. The models revealed that (1) *experience*; (2) *internal expertise*; and (3) *PU* could be used to influence *PEOU*. Managers should choose the AIS that fulfils users' expectations and

ensure it is used continuously without interruptions and delay. The AIS also needs to provide accurate and precise information with a user friendly format and through a convenient interface. It should adapt easily to changes related to processes and policies such as changes in depreciation rates and recording methods, changes in exchange rates, changes in direct and indirect taxes and other industry specific changes, which should be easily adopted in the system. AIS should also communicate easily with other parts of the IS. Internal expertise is the factor which explains most of the variance in *PEOU*. In most organisations the IT department is responsible for the effective operation of the IT/IS. It must be staffed with employees that have deep knowledge of the IT/IS in order to solve problems faced by the users and enable users to understand the potential benefits gained through the use of IT/IS. When a user is confident that every problem that he faces or might face can be solved by IT department staff, he is more likely to perceive the system as easy to use, and he will use it more intensively.

The findings from the study show that the AIS users were not satisfied with the services provided by technical staff from the IS department. Recruitment and selection of new staff represent important managerial actions that can improve technology acceptance and AIS performance. The managers could also avoid high cost in training and consultancy by appointing staff with experience in AIS and IT/IS. Those with experience in computer technologies, could more easily accept and work with any AIS with minimum training. Individuals who have greater familiarity with technology in general, and AIS in particular and those who have greater prior experiences with similar technologies are likely to have more positive beliefs about usefulness and ease of use. These are the kinds of individuals organisations might wish to recruit or target in order to reduce training costs. The findings from this study will help hotel managers,

especially in Malaysia to have better ideas about factors that would contribute to users' *PU* and *PEOU*.

Increasingly, IS's need to provide useful information for diverse sets of user needs, aid managers in making decisions, and help automate many routine activities. This must often be accomplished in an organisational environment that is increasingly integrated and requires a comprehensive database system that is founded on the events that define the organisations activities. Organisations need to take a proactive approach to increase users' acceptance of IS/AIS and ensure they are satisfied with the systems by involving them in development processes toward a successful end result. The managers in the hotel industry should choose AIS that will ultimately lead to the most effective use of the system. To do this, it is necessary to understand the importance of each construct, their related factors and their relationships. Hotel managements should plan actions to improve the benefits and scope of their AIS usage. Top management in hotel companies could also use the findings from this study to see a greater scope of benefits from accounting reports. This would create greater awareness about the importance of IS/AIS and their contribution to competitive advantages and ultimately to overall organisational impact. Related government agencies can improve their current regulations based on the results obtained here to enhance their support and governance within the hotel industry. For example, from the survey and interviews, hotels have problem to send staff for training because of cost, thus, tax reduction or other mean of help such as interest free loans for IT/IS investment could be offered. Emerging economies are found to rely heavily on government assistance and incentives to accelerate the use of IT (Kraemer et al., 1992).

9.2 Originality of the Research

It is important for any PhD thesis to demonstrate originality that differentiates it from other research. According to Collis and Hussey (2009), originality and contributions to knowledge are among the criteria needed in a new thesis to be different from other research work. This is in agreement with the statement by Phillips and Pugh (2005, p. 61) when they stressed that 'the PhD is awarded for an original contribution to knowledge'.

Originality is viewed in a number of possible ways as defined by many authors (e.g.: Collis and Hussay, 2009; Phillips and Pugh, 2005; Francis, 1976). Among the definitions of originality is that it can continuing a previously original piece of work, carrying out empirical work that has not been done before, trying out something that has previously only been done abroad, a new area of discipline (such as AIS in this case in term of acceptance and satisfaction) that have not been looked at before and many more.

- This current study is about the usage of and satisfaction with accounting information system in hotel industry in a Malaysian context. The study investigated the factors that contributed to usage and satisfaction with the system which might then affect the AIS and ultimately the hotel companies' performance. The originality of this study as shown by the topic in research is sound.

- The data was a primary source which is collected from both surveys and interviews. The responding hotels were based on a current list available from Tourism Malaysia and Malaysian Hotel of association (MAH). Hotel's rating is also based on the most recent list provided by the Ministry of Tourism Malaysia.

Thus, this study is carrying out an empirical work that has not been undertaken before.

- Data analysis is using partial least squares (PLS) which is the latest method in the family of structural equation modelling (SEM). The software used was PLS-Graph 3.0 which is new in the market. This research relies on statistical techniques and statistical software packages (PLS-Graph 3.0 and SPSS) including factor analysis, validation of measurement model and assessment of structural model. The techniques used in the study were given explanations prior to the testing of hypotheses to demonstrate knowledge and understanding of these techniques by the researcher.

- This study produced critical use of published work as presented in chapter two of literature review. Existing literature in Chapter Two covers reviews about the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) and the DeLone and McLean Model, which are used in the studies about user behaviour and success of IT/IS. Chapters Eight and Nine deal with discussions and conclusion about the findings from this research which demonstrates the ability to make critical use of published articles and materials. The findings from this study are linked back to the literature.

This empirical work has not been undertaken before, in terms of the topic of the research, the data sources or the analysis technique. These are all therefore original contributions.

9.3 Limitations and Areas of Future Research

There are limitations to any work which should be acknowledged and areas for future research which may build on it. This study was conducted in one sector, which is the hotel industry, with a unique organisational culture and some specific characteristics. As a result the findings might not be generalizable to other sectors and environments. The current work was conducted on AIS which operates in a somewhat mandatory setting, that is, the decision to which AIS package and applications are decided by top management or accounting manager, where the AIS users in accounting department cannot choose the AIS they are prefer. Different results may be obtained in voluntary settings, where each user has freedom to adopt the system based on their preferences. Caution must be exercised in any attempt to generalize these findings directly to individual *usage* of the system. Thus, future research should examine other *usage* contexts to test the boundary conditions of the proposed model.

This study used likert scales to record respondent perception. Such a research approach is common in this field. However bias may come from respondent's tendency to respond to items without sufficient regard for its true content (Friborg et al., 2006). DeVellis (1991) and Nunnally (1978) pointed out that likert scales can introduce what is called an acquiescence bias. Though every care was taken to obtain genuine responses and the survey was supported by interviews.

The opening statement of the covering letter was used to impress on respondents the significance of AIS. There was the possibility that this statement might have influenced their perception of the hotel AIS. However, questionnaire responses where quite wide and the interviews did not detect any undue influence.

The sample size from the survey is small (101) that may have limited its insight. The same set of data was used for exploratory and confirmatory factor analysis because of the small sample size. This may hamper general agreement on the use of the instrument. A larger data sample could be sought and this may provide greater confidence in the results. However, the use of PLS as a technique of data analysis overcomes some of the problem of low response rate because one of the advantages of PLS is its minimal demands on sample size. This could deal with the relatively small sample size, though a response rate of 27.52% is generally considered acceptable.

In this study, only the views of managers in the accounting department were solicited; i.e the sample represents individuals who use the systems in practice. The use of only direct users of AIS may generate some measurement inaccuracy but was appropriate to gauge satisfaction with the system. Future research may consider involving managers in other department who use reports produced by AIS in their decision making process. As an effort to improve the reliability of the findings, more research is needed to investigate the views of other users who do not use the system directly. This study was focused, however, on the usage of and satisfaction with the AIS, by those who directly using AIS. Efforts should also be considered in the future to have broader views about the AIS by users who are using the output produced by the AIS and also taking opinions from IT staff that provide services in order to ensure the AIS could operate and be used effectively.

This study did not control for the types of AIS used by the participating companies. The sample comprised of different AIS software such as SUN Accounting System, Bistrak Accounting and Fidelio Opera Reservation System. It is possible that the heterogeneous

nature of the AIS used might be result in a broader picture. Future research should endeavour to investigate the use of homogeneous sets of AIS.

Almost all scales employed in this work have been validated in prior research. The scales exhibited high reliability and validity in most studies at all points of measurement, but additional work is certainly warranted to further validate and improve the scales and the role of constructs by using this scale in other user acceptance and satisfaction research, i.e. in different sectors, different types of IS, different cultures etc. Replicating this effort through additional studies in Malaysia is also recommended with varying methodologies such as case studies which may permit deeper insights and diverse samples to overcome possible methodological biases. The current work presented a cross-sectional analysis of the data, thus relying to a great extent on the theory to support causality. Cross-sectional surveys are also sometimes criticised due to lack of specificity. Future work should focus on a longitudinal analysis in order to strengthen the direction of causality proposed by the model. The proposed model needs to be tested in different contexts to establish greater external validity.

Further research could also focus on modes and content of the training in terms of AIS. Methods of training are also important for effective outcomes, for example using a lecture approach with a skilled trainer as opposed to self-study methods. Training could be used to encourage users to adopt a greater diversity of software for a wider variety of tasks. Training options are available and could be explored for their role in facilitating AIS users to accept and become more satisfied with the system. Future research should also study the specific TMS needs of the accounting department to improve the effective use of AIS. Accounting managers could seek ways to strengthen management support for wider AIS scope and usage. In terms of user involvement, studies about the

role of users, how and how much the early involvement of users contributes to the usage and satisfaction of its final systems. Greater ISS in the hotel industry is needed. Currently the sophistication is relatively low. Further studies are required to investigate the negative relationship of ISS to PEOU in hotel industry in Malaysia. This contradicted the findings of previous studies that showed the importance of ISS to successfully implement a technology (Wixom and Watson, 2001; Chau and Tam, 1997; Grover, 1993; Cash et al., 1992). Thus, more studies are called for to establish what is needed by AIS users in terms of ISS.

In the hotel companies in Malaysia, lack of internal expertise of AIS and IS is crucial, further external expertise could play a role to support the hotels more than it does. Future study should explore the importance of external expertise especially vendors and consultants to help the hotels implement and improve the systems. Hotels should devote more direct effort at selecting and engaging high quality external vendors and consultants to achieve a higher level of implementation effectiveness. Efforts should be made in future to investigate exactly what qualities and attributes are applicable to effective external expertise, especially for vendors and consultants. Vendors and consultant can play their role to provide formal computer education and training programs specifically designed for hotel companies, perhaps with help and support from the government. External training had a much greater effect on usage than internal training (Igbaria et al., 1997). It highlights a strong need for consultants and vendors to assist the hotel companies in their computer activities. However, the results of this study found that, hotel companies are reluctant to hire consultants because of costs and associated risks (Zinatelli et al., 1996). Research in the future could consider the role for government agencies to help hotel companies to plan the strategies to make external

support more available and affordable for hotels. They could also improve their policy-making with insights into computer penetration into the business.

In this study, an objective performance measure for the organisation was not obtained due to the sensitive nature of such information. The respondents in this study only gave their opinions about the ability of AIS to improve certain aspects of organisational impact. Thus, the measurement of organisational impact relied upon respondents' perceptions on selected variables. Further research could investigate other variables such as annual turnover, annual IT/IS investment, reported profitability etc.

While the proposed model demonstrated a relatively high R^2 values for PU and satisfaction (72.8% and 77.5% respectively), there was still a need to locate additional variables to improve the ability to predict PEOU, usage and organisational impact (48.2%, 55.9% and 24.1% respectively). This leads to question of what variables account for the remaining variance of PEOU, usage and organisational impact, which is currently unexplained. Thus, it would be interesting to explore possible differences of AIS acceptance and satisfaction with different organisational profiles such as industry type and managerial style. This study only focused on certain factors of external variables. Other factors such as peer support, social pressure, availability and accessibility, which may affect user beliefs, usage and satisfaction, could be included in future studies. There will be more complex TAM models to assess, thus, there still opportunities for further development of the original TAM.

9.4 Closing Remarks

The study was one of the first to explore AIS in hotels in Malaysia. It achieved over 100 survey responses and was supported by interviews. It was concerned to discover the current status and 'performance' of AIS in Malaysian hotels. It tested in an original setting an established IS implementation model (TAM). Overall, the contributions of this research increase our knowledge of AIS, including theory advancement as well as providing insights to guide practice.

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Appendices

Appendix 1: Developing Countries - Criteria and Comparison

General characteristics of the developing countries are as follows.
a. Average income per capita of the population was generally low.
b. Education levels low average population.
c. Life expectancy lower average population.
d. Population growth rate per year is quite high.
e. The mortality rate is relatively high population per year.
f. Livelihoods of the population is generally patterned agrarian.
g. Narrow the field work.
h. Commodity exports of raw materials, rather than processed ingredients.
i. The majority of the population lives in rural areas.
j. Low levels of population health.
k. High unemployment figures.

Comparing Malaysian statistics and other developing countries
(for year 2006)

Statistic category	Malaysia	Philippine	Thailand	Indonesia
Income category Source: World Bank income categories	Upper middle income	Lower middle income	Lower middle income	Low income
GDP Source: CIA World Factbooks	US$313.2 billion	US$378.3 billion	US$596. billion	US$948.3 billion
GDP growth (annual) Source: World Development Indicators Database	5.16%	4.97%	4.46%	5.6%
GDP (per capita) Source: CIA World Factbooks	US$12,155.27 per capita	US$5,317.43 per capita	US$9,216.00 per capita	US$4,251.67 per capita
GDP (PPP) Source: World Bank	US$246 billion	US$378.23 billion	US$510. 27 billion	US$779,72 billion
Gross national income	US$79.4 billion	US$80.85 billion	US$118 billion	US$145 billion

The table above shows the comparison between Malaysia and other three developing countries in the same region. Malaysia is one of the wealthiest and most developed countries, in Southeast Asia, outranked in GNP only by Singapore and Brunei. Malaysia has had one of the best economic records in Asia, with GDP growing an average 6.5 per cent annually from 1957 to 2005. In 2011 the GDP (PPP) was about $450 billion, the 3rd largest economy in ASEAN and 29th largest in the world.

Appendix 2: Cover Letters and Questionnaire

29 March 2010

Dear Sir/Madam,

A SURVEY OF USER ACCEPTANCE AND SATISFACTION WITH ACCOUNTING INFORMATION SYSTEMS (AIS)

Investment in Accounting Information Systems (AIS) and Information Systems (IS) in hotel industry helps to improve operational efficiency, reduce costs and enhance service quality. Results from previous studies showed a positive and significant relationship between the use of Information Technology (IT) and the development of a competitive advantage for hospitality industries

As an **accountant / finance manager / accounts & finance executive / AIS user**, your responses to this questionnaire are very important in enabling me to obtain as much understanding as possible of this topical issue. The utmost **confidentiality** will be observed in using the information given. Your responses will only be presented in aggregate form and no single hotel's results will be highligted.

Enclosed is a stamped, self-addressed envelope for your convenience. If you have any queries or would like further information, please do not hesitate to contact me. Your participation in this research study is very much appreciated.

Thank you.

Yours faithfully,

……
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Contact no. : 09-7717000 / 014-2101420

Supervisors:
Professor Mike Tayles (Director, Centre of International Accounting and Finance)
University of Hull, Hull, HU6 7RX, UK

THE UNIVERSITY OF HULL

26 April 2010

Dear Sir/Madam,

A SURVEY OF USER ACCEPTANCE AND SATISFACTION WITH ACCOUNTING INFORMATION SYSTEMS (AIS)

About a month ago, a questionnaire seeking information about user acceptance and satisfaction with the AIS currently employed by your hotel was mailed to you. If you already completed and returned it to me, please accept my sincere thanks.

If no, I would like to ask your co-operation to return it as soon as possible because your answers are very important to the accuracy of this study. The utmost **confidentiality** will be observed in using the information given.

Thank you.

Yours faithfully,

……

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Supervisors:
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University of Hull, Hull, HU6 7RX, UK

THE UNIVERSITY OF HULL

24 May 2010

Dear Sir/Madam,

A SURVEY OF USER ACCEPTANCE AND SATISFACTION WITH ACCOUNTING INFORMATION SYSTEMS (AIS)

About two months ago, I wrote to you seeking information about user acceptance and satisfaction with the AIS currently employed by your hotel. However, I still do not receive your feedback.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Therefore, please provide some of your time to look at it and return the completed questionnaire to me as soon as possible. Your co-operation is very much appreciated.

The utmost **confidentiality** will be observed in using the information given.

Thank you.

Yours faithfully,

……

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UNIVERSITI MALAYSIA KELANTAN

QUESTIONNAIRE

To be answered by the Senior Accounting Executive / AIS User

USAGEOF AND SATISFACTION WITH ACCOUNTING INFORMATION SYSTEMS (AIS): THE CASE OF THE HOTEL INDUSTRY IN MALAYSIA

The purpose of this study is to gain better understanding about the factors that contribute to the usage of and satisfaction with the AIS. Therefore, on behalf of your accounts department, we would like to ask you to answer questions (approximately 20 minutes) related to these factors. Your answers are very important to the accuracy of our study.

Would you like to participate in 3 prize draws of RM200 each and receive a copy of the executive summary of the results of this research?

□ Yes □ No

If **YES**, please provide a name and address below (or attach a business card) of person completing questionnaire

Name : .....

Position : .....

Address : .....

.....

(This information will only be used for the draw prize and sending you a copy of executive summary of the results. It will not be recorded or revealed to third parties)

INFORMATION GATHERED WILL BE KEPT STRICTLY CONFIDENTIAL

Please return the completed questionnaire using the self-addressed envelope enclosed at your earliest possible convenience.

The sequence number will be used for data validation purposes only

Accounting Information Systems (AIS) is a computer-based system that transforms business events into accounting information for internal and external users. Example of AIS in hotel industry: SUN system, Quickbooks, MYOB, Opera PMS, BugHotel Accounting, IFCA, HOS and ACCPAC.

SCALES (Please use 4 infrequently)

Disagree				**Agree**		
1	2	3	4	5	6	7
Strongly	Quite	Slightly	Neither	Slightly	Quite	Strongly

SECTION A

Please answer the questions on behalf of your accounting department**.** Circle to reflect your opinion about the AIS which is currently used in your hotel

		Disagree						**Agree**
1.	Learning to use AIS is easy for us.	1	2	3	4	5	6	7
2.	We find it easy to get AIS to do what we want it to do.	1	2	3	4	5	6	7
3.	Our interaction with AIS is clear and understandable.	1	2	3	4	5	6	7
4.	We find AIS is flexible to interact with.	1	2	3	4	5	6	7
5.	It is easy for us to become skillful at using AIS.	1	2	3	4	5	6	7
6.	We find AIS easy to use.	1	2	3	4	5	6	7
7.	Using AIS enhances our effectiveness on the job.	1	2	3	4	5	6	7
8.	Using AIS improves our job performance.	1	2	3	4	5	6	7
9.	Using AIS makes it easier to do our job.	1	2	3	4	5	6	7
10.	Using AIS in our job would enable us to accomplish tasks more quickly.	1	2	3	4	5	6	7
11.	Using AIS in our job increases our productivity.	1	2	3	4	5	6	7
12.	We find AIS useful in our job.	1	2	3	4	5	6	7
13.	The frequency of AIS use is high.	1	2	3	4	5	6	7
14.	Based on our experience, we use AIS.	1	2	3	4	5	6	7
15.	Our use of AIS is more than our original expectations.	1	2	3	4	5	6	7
16.	The use of reports or outputs from AIS is major in our job.	1	2	3	4	5	6	7
17.	We are dependent on AIS.	1	2	3	4	5	6	7
18.	We are satisfied with AIS effectiveness.	1	2	3	4	5	6	7
19.	We are pleased with the experience of using AIS.	1	2	3	4	5	6	7
20.	AIS has met our expectations.	1	2	3	4	5	6	7
21.	We are satisfied with AIS efficiency.	1	2	3	4	5	6	7
22.	Overall, we are satisfied with AIS.	1	2	3	4	5	6	7

SECTION B

Please answer in relation to **your corporate environment.** Circle to reflect your opinion about the AIS which is currently used in your hotel

Top Management (TM) Support	**Disagree**						**Agree**
1. TM makes an effort to provide stable funding for AIS development and operational activities.	1	2	3	4	5	6	7
2. TM takes part in deciding in what order AIS should be implemented.	1	2	3	4	5	6	7
3. TM is much concerned with the performance of AIS operation.	1	2	3	4	5	6	7
4. TM strives to have the latest technology.	1	2	3	4	5	6	7
Training							
1. Internal training of AIS is provided for accounting staff.	1	2	3	4	5	6	7
2. There is clarity of end-users' role and objectives before training.	1	2	3	4	5	6	7
3. IT support after training is available.	1	2	3	4	5	6	7
4. Training programs precede effective AIS usage.	1	2	3	4	5	6	7
User Involvement							
5. Accounting staff are involved in choosing and/or design of AIS.	1	2	3	4	5	6	7
2. Accounting staff guide and direct the process of specifying and clarifying the <u>input</u> requirements and details for the AIS.	1	2	3	4	5	6	7
3. Accounting staff guide and direct the process of specifying and clarifying the <u>output</u> requirements and details for the AIS.	1	2	3	4	5	6	7
4. Accounting staff are involved in any modification and/or changes in AIS.	1	2	3	4	5	6	7
IS Sophistication							
5. The hotel shares databases for various applications, rather than having a separate database for each application.	1	2	3	4	5	6	7
6. There are integrated IS applications encompassing different functional areas.	1	2	3	4	5	6	7
7. This hotel manages hotel-wide communication network services.	1	2	3	4	5	6	7
8. This hotel has a good telecommunication infrastructure.	1	2	3	4	5	6	7
Internal Expertise							
1. The accounting staff are adequate to manage tasks.	1	2	3	4	5	6	7
2. The management are satisfied with the services provided by accounting staff.	1	2	3	4	5	6	7
3. The accounting staff are skillful at using AIS.	1	2	3	4	5	6	7
4. The IT staff are adequate to support the accounting system services.	1	2	3	4	5	6	7

SCALES (Please use 4 infrequently)

Dissatisfied				**Satisfied**		
1	2	3	4	5	6	7
Strongly	Quite	Slightly	Neither	Slightly	Quite	Strongly

External Expertise Please indicate the following expertise you normally seek on matters regarding AIS and IS of your hotel. If your answer is YES, please rate your level of satisfaction for each of the sources		**If YES** **dissatisfied satisfied**
1. Consultants	□ Yes □ No	1 2 3 4 5 6 7
2. Vendors / Dealers	□ Yes □ No	1 2 3 4 5 6 7
3. Government agencies	□ Yes □ No	1 2 3 4 5 6 7
4. Accounting / Auditing firms	□ Yes □ No	1 2 3 4 5 6 7

SECTION C

Please circle to reflect your opinion about the extent of AIS impact to your hotel

The use of AIS has	**No extent**						**Large extent**
1. reduced operating costs.	1	2	3	4	5	6	7
2. improved service quality.	1	2	3	4	5	6	7
3. improved operating performance.	1	2	3	4	5	6	7
4. improved customer loyalty.	1	2	3	4	5	6	7
5. improved sales growth.	1	2	3	4	5	6	7
6. improved overall performance of the hotel.	1	2	3	4	5	6	7

SECTION D

Please circle to reflect your opinion about the level of your department's experience with AIS.

User Experience	**Low**						**High**
1. Our experience in using AIS	1	2	3	4	5	6	7
2. Our experience in implementing AIS	1	2	3	4	5	6	7
3. Our experience in maintaining / modifying AIS	1	2	3	4	5	6	7
4. Overall, our AIS ability	1	2	3	4	5	6	7

SECTION E: GENERAL INFORMATION

1. What is your present job title?	_____
2. How long have you been in your current position?	_____ years
3. How long have you been with the hotel?	_____ years
4. Your highest level of education	□ Masters or higher □ Diploma □ Degree □ STPM / SPM

SECTION F: COMPANY PROFILE

1. Is the hotel a chain or independent?	□ A chain hotel □ An independent hotel
2. Approximately how many equivalent full-time employees does your hotel employ?	_____
3. How many rooms are available in the hotel?	□ Less than 150 rooms □ 151 to 300 rooms □ more than 300 rooms
4. Approximately how much is your annual turnover for the latest financial year?	_____
1 Will you be prepared to participate in a further interview through telephone or in person?	□ Yes □ No

SECTION G

Please provide some information about AIS and IS usage for us to understand better your decisions related to its implementation.

1. Presented is a list of information technologies which can be found in the hotel industry. Please tick the technologies presently used by your firm. *(You may tick one or more boxes if appropriate).*
   - □ Decision Support Systems - (These applications include word-processing, graphics and presentation packages, spreadsheets and similar)
   - □ Database Systems - (These applications include personnel and other non-accounting systems)
   - □ Accounting-Based Applications - (These applications include payroll, receivables, payables, general ledger, order entry and billing)
   - □ Related Management Systems - (These applications are related to inventory management, purchasing, operation planning and control)
   - □ Local Area Network - (Communication system which interconnects computers within an organisation such as local e-mail, application and data sharing)
   - □ External Network - (Communication system that interconnects computers at geographically dispersed locations such as Internet, Electronic Data Interchange and external data sources)
   - □ Others _____
     (Please specify)

2. Which type of processing does your AIS currently use? (*You may tick one or more boxes if appropriate*)

- □ Batches - (periodic processing of data)
- □ Online batches - (entered as transaction occurs but processed later)
- □ Online and real time - (entered as transaction occurs and processed immediately)

3. What sources of software does your hotel currently use for AIS? (*You may tick one or more boxes if appropriate*)

- □ Standard package, unmodified - (Refers to a package that you simply install and use without modification)
- □ Standard package, modified externally - (Refers to a package that has been modified by external expertise)
- □ Standard package, modified internally - (Refers to package that has been modified by your IT staff)
- □ Externally custom-developed package - (Refers to an application developed from scratch by external expertise)
- □ Internally custom-developed package - (Refers to an application developed from scratch by your IT staff)

4. Among the following computer applications, please tick the applications presently implemented in your hotel. (*You may tick one or more boxes if appropriate*).

- □ Accounts receivables
- □ Cost accounting
- □ Financial accounting
- □ Operational planning and control
- □ Online payment and receipting system
- □ Billing
- □ General ledger
- □ Payroll
- □ Accounts payable
- □ Order entry
- □ Personnel management
- □ Budget variances
- □ Purchasing
- □ Budgeting
- □ Inventory
- □ Online reservation system
- □ Other_____

5. What types of IT planning were taken by your hotel before the implementation of your most recent AIS? *(You may tick one or more boxes if appropriate)*

- □ Financial resources planning
- □ Human resources planning (e.g. manpower and training)
- □ Information requirement analysis
- □ Implementation planning (e.g. software development, installation and conversion)
- □ Post-implementation review (e.g. operation, maintenance, future computer needs)
- □ Others _____
  (Please specify)

6. Please provide the specific name of AIS currently used in your hotel.	_____

Please use this space to write any comments you wish to make:

Please return the completed questionnaire using the self-addressed envelope enclosed at your earliest possible convenience.

THANK YOU FOR YOUR PARTICIPATION AND CONTRIBUTION IN THIS SURVEY.

Appendix 3: Interview Schedule

Interview Schedule

Q1 The AIS currently used

- Why do you choose it?
  -Top in the market?
  -Have experience with it?
- Are any staff involve in choosing or modifying AIS?
  - Who are involved?
  - How much involvement?
  - Is it high or low involvement?
  -Can you give example(s) of those involvements?
- From your point of view, how such involvement gives impact to the usefulness of AIS?
  - Examples?
  - In what ways did those involvements make AIS easy to use?
  - Can you give details?
- Could you briefly explain the process of choosing AIS?
  - A few vendors came to demonstrates different package?
  - How top management involve in this process?

Q2 Factors that you considered when choosing AIS

- Is cost important factor?
- Does top management support AIS usage?
  - How does it support?
  - Examples?
- Is AIS stand-alone or integrated with other systems such as front desk and restaurant?
  - How does such integration affect AIS performance?
- Do you seek for external expertise to help you with the AIS?
  - Which external party(s) do you seek?
  - How do they help you?
  - Are you depending on vendors or dealers support to continue using the systems?
  - How do you think government agencies could support you in terms of technology usage in general and AIS in particular?
  - Do you think external support is important to you?
  - How much?

Q3 Who are using AIS?

- Do you have enough internal expertise to use AIS?
  - Do you appointed accounts staff with AIS knowledge?
  - How do you improve their skills?
  - Do staff need training to use AIS?
  - Is it internal or external training?
  - How often training is provided?
  - Is it on-going training?

- What kind of training do they need?
- Example?
- Do you find it effective?
- Example?

- Are you satisfied with your staff skill/knowledge to handle AIS?

Q4 AIS usefulness for the hotel operation

- Why is it useful?
  - How does AIS help hotel operations?
  - Can you explain in details?
  - Link to front desk?
  - Other departments?
  - Provide daily reports of income, costs, profits?
  - Decision making?
- Can AIS provides you with all information you need?
  - Examples of information that you highly used?
- Is AIS useful to accounts people only?
  - How does AIS help other managers?
  - Example?
- Because it is useful so the AIS usage is high?
  - Can you comment on this statement?
- Because it is useful so you are satisfied with it?
  - Do you agree?
- With and without AIS, (using or not using AIS) is there any difference to hotel management?
  - To suppliers?
  - To hotel guests?
- Can we say that, compared to other hotels in the same area, one of the factors that guests come and stay in your hotel is because you are using AIS?
  - Do you agree?
  - Can you comment?
- Is AIS important to guests?
  - How important?
  - Could you please give examples?

Q5 AIS easeof use

- Because it is easy to use so the usage is high?
  - Can you explain?
- Because it is easy to use so you are satisfied with it?
  - Can you comment the statement?

Q7 Satisfaction with the current AIS used in your hotel

- How satisfied are you?
  - Is it because it is useful to hotel operation?
  - Is it because it is easy to use?
  - Or is it because it is there and you have to use it?

- Do your staff see the systems as useful?
  - Why do you think so?
  - Can you rate it?
  - Is it low or high?

Q8 Is it worth the hotel to invest in information technologies including AIS?

- In terms of what?
  - Can you provide examples which relate to your hotel?
- How can investment in AIS help your hotel in terms of competitive advantage?
  - Compared to your competitors?
  - Can you give examples?
- How AIS give impact to hotel performance?
  - Can you give examples?
  - Operating costs?
  - Sales growth?
  - Service quality?
  - Operating performance?
  - Customer loyalty?
  - Overall performance?
- From your point of view, is it possible for a hotel like yours not to use AIS?
  - Why do you say so?
  - Can we say that, AIS is very important to the hotel operation?
- Can we say that, to be effective and efficient hotel operation, AIS is a must?
  - Can you comment?
- Would you recommend the current AIS that you are using to other hotels?
  - Why?

Appendix 4: Normality Tests

The Tests of Normality

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perceived usefulness (PU)						
Using AIS in our job would enable us to accomplish tasks more quickly	.248	101	.000	.778	101	.000
Using AIS improves our job performance	.234	101	.000	.860	101	.000
Using AIS in our job increases our productivity	.248	101	.000	.833	101	.000
Using AIS enhances our effectiveness on the job	.287	101	.000	.803	101	.000
Using AIS makes it easier to do our job	.307	101	.000	.818	101	.000
We find AIS useful in our job	.243	101	.000	.818	101	.000
Perceived ease of use (PEOU)						
Learning to use AIS is easy for us	.317	101	.000	.805	101	.000
We find it easy to get AIS to do what we want it to do	.272	101	.000	.841	101	.000
Our interaction with AIS is clear and understandable	.260	101	.000	.854	101	.000
We find AIS is flexible to interact with	.292	101	.000	.830	101	.000
It is easy for us to become skilful at using AIS	.316	101	.000	.819	101	.000
We find AIS easy to use	.272	101	.000	.852	101	.000
Usage						
The frequency of AIS use is high	.278	101	.000	.819	101	.000
Based on our experience, we are very likely to use AIS	.249	101	.000	.815	101	.000
The use of AIS is more than our original expectations	.222	101	.000	.871	101	.000
The use of reports or output from AIS is major in our job	.265	101	.000	.847	101	.000
We are dependent on AIS	.261	101	.000	.864	101	.000
Satisfaction						
We are satisfied with AIS efficiency	.270	101	.000	.860	101	.000

We are pleased with the experienced of using AIS	.256	101	.000	.869	101	.000
We are satisfied with AIS effectiveness	.278	101	.000	.853	101	.000
AIS has met our expectation	.258	101	.000	.809	101	.000
Overall, we are satisfied with AIS	.318	101	.000	.814	101	.000
Top management (TM) support						
TM makes an effort to provide stable funding for AIS development and operation activities	.218	101	.000	.882	101	.000
TM takes part in deciding in what order AIS should be implemented	.180	101	.000	.865	101	.000
TM is much concerned with the performance of AIS operation.	.247	101	.000	.877	101	.000
TM strives to have latest technology.	.233	101	.000	.897	101	.000
Training						
Internal training of AIS is provided for accounting staffs	.253	101	.000	.841	101	.000
There are clarity of end-users' role and objectives before training	.250	101	.000	.871	101	.000
IT support after training is available	.218	101	.000	.869	101	.000
Training programs precede effective AIS usage	.280	101	.000	.861	101	.000
Involvement						
Accounting staffs are involved in choosing and/or design of AIS	.230	101	.000	.911	101	.000
Accounting staffs guide and direct the process of specifying and clarifying the input requirements and details for the AIS	.212	101	.000	.889	101	.000
Accounting staffs guide and direct the process of specifying and clarifying the output requirements and details for the AIS	.203	101	.000	.905	101	.000
Accounting staffs are involved in any modification and/or changes in AIS	.218	101	.000	.895	101	.000
IS sophistication						
The hotel shares databases for various applications, rather than having a separate database for each application	.250	101	.000	.849	101	.000

There are integrated IS applications encompassing different functional areas	.221	101	.000	.874	101	.000
This hotel manages hotel-wide communication network services	.234	101	.000	.856	101	.000
This hotel has a good telecommunication infrastructure	.222	101	.000	.885	101	.000
Internal expertise						
The accounting staffs are adequate to manage tasks	.281	101	.000	.848	101	.000
The management are satisfied with the services provided by accounting staffs	.259	101	.000	.859	101	.000
The accounting staffs are skilful at using AIS	.268	101	.000	.863	101	.000
The IT staffs are adequate to support the accounting system services	.226	101	.000	.871	101	.000
External expertise						
Consultants	.409	101	.000	.610	101	.000
Vendors / dealers	.496	101	.000	.476	101	.000
Government agencies	.449	101	.000	.567	101	.000
Accounting / auditing firms	.343	101	.000	.636	101	.000
Experience						
Our experience in using AIS	.325	101	.000	.764	101	.000
Our experience in implementing AIS	.279	101	.000	.814	101	.000
Our experience in maintaining / modifying AIS	.237	101	.000	.862	101	.000
Overall, our AIS ability	.299	101	.000	.807	101	.000
Organisational impact						
Reduced operating costs	.228	101	.000	.875	101	.000
Improved service quality	.265	101	.000	.834	101	.000
Improved operating performance	.267	101	.000	.814	101	.000
Improved public image and client's loyalty	.189	101	.000	.929	101	.000
Improved sales growth	.190	101	.000	.922	101	.000
Improved overall performance of the hotel	.232	101	.000	.837	101	.000

Appendix 5: Conceptual Model – sub-tests

Appendix 5-1

This appendix explains four further robustness tests to demonstrate that there is no simple way to improve the main proposed conceptual model.

Appendix 5-1A: The Conceptual Model Sub-Test A (*ISS → PEOU*)

In the main model and all previous sub-tests 1 to 4 in chapter 6, information systems sophistication was linked with *PU*. The summary of the results were as follows:

Table A5.1: Summary of results for
Information Systems Sophistication → Perceived Usefulness

Conceptual model in chapter 6	Beta value	T-value	Sig.	Sig. Level
Main model (H2A)	-0.154	2.3653	Yes	0.05
Sub-test 1 (H2B)	-0.154	2.3659	Yes	0.05
Sub-test 2 (H2C)	-0.004	0.7086	No	-
Sub-test 3 (H2D)	-0.112	1.6559	Yes	0.10
Sub-test 4 (H2E)	-0.207	3.1144	Yes	0.01

The above Table A5-1 shows that the impact of information systems sophistication resulted in a negative influence when related to *PU*. In all attempts only one resulted in a not significant impact on *PU*. In this sub-test A, information systems sophistication was changed to link with *PEOU* (Figure A6.1). The new path connecting information systems sophistication with *PEOU* (H2F) generated a non-significant relationship with a co-efficient of 0.097 and t-value of 0.7122. Therefore the hypothesis is rejected.

The only path that is affected by the above change is that of *involvement* with *PU*. In previous attempts *involvement* is seen to significantly impact *PU* at p-value < 0.05 (eg. H3A in the main model), however, in this attempt, *involvement* reduced to only provide

some qualified support over *PU* at p-value < 0.10. Other remaining hypotheses show no impact regarding this change.

The R^2 value for *PU* reduced from 72.8% in the previous tests to 71.2% in Figure A5.1. The R^2 value for *PEOU* shows very little incremental change with association of *ISS*. Other R^2 values remain the same as before with *usage* (55.9%), *satisfaction* (77.5%) and *organisational impact* (24.1%). Therefore, it can be concluded that, this sub-test A cannot improve the proposed main conceptual model.

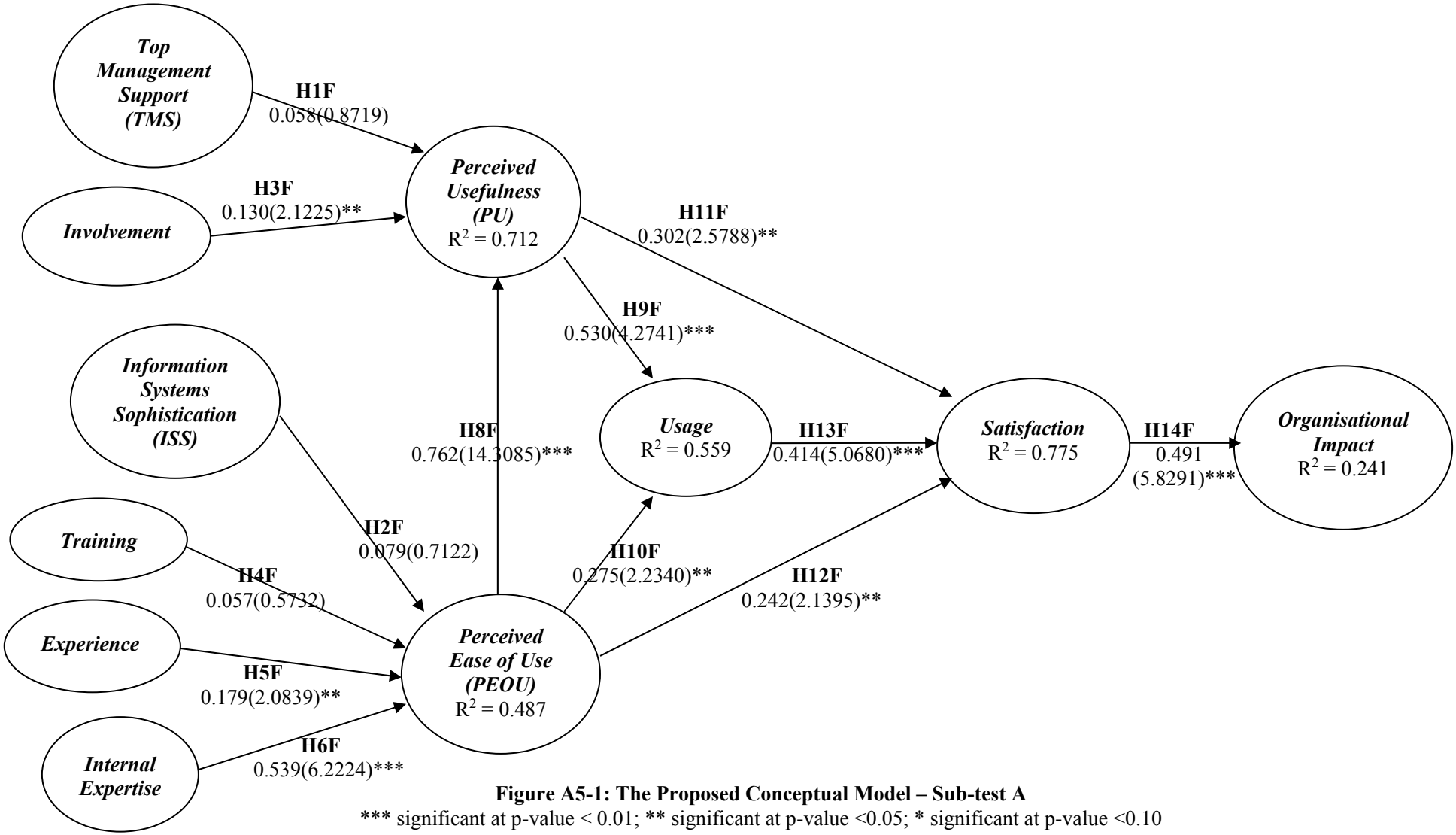

Figure A5-1: The Proposed Conceptual Model – Sub-test A

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

Appendix 5-1B: The Conceptual Model Sub-Test B (*Involvement→ PEOU*)

In chapter 6 and in the above section of sub-test A, *involvement* was associated to link with *PU* and the summary results are presented in Table A5.2 below.

Table A5.2: Summary of results for *Involvement → Perceived usefulness*

Conceptual model in chapter 6	Beta value	T-value	Sig.	Sig. Level
Main model (H3A)	0.158	2.5606	Yes	0.05
Sub-test 1 (H3B)	0.158	2.5606	Yes	0.05
Sub-test 2 (H3C)	0.252	2.4170	Yes	0.05
Sub-test 3 (H3D)	0.102	2.9160	Yes	0.01
Sub-test 4 (H3E)	0.125	2.0294	Yes	0.05
Sub-test A (H3F)	0.130	2.1225	Yes	0.05

The above results show that the *involvement* construct when linked to the *PU* construct generated a strong positive relationship which is statistically significant. In this sub-test B, the test is run to see the impact of the whole model if *involvement* is directed towards *PEOU* (H3G). The outcome, however, in relation to the path connecting the *involvement* construct with *PEOU* (Figure A5.2) is totally different and the hypothesis is rejected. The results indicate that the beta path co-efficient between the two constructs is negative and not statistically significant ($\beta = -0.050$; $t = 0.5436$).

The change in the placing of the *involvement* construct also does not affect the results of the remaining hypotheses; all other hypotheses are supported except for H4G which is the relationship between *training* and *PEOU*. This result for H4G is the same as obtained in previous attempts. In terms of R^2 values, the results generated in this sub-test 4, are similar to those results obtained previously, as follows: *PU* (70.9%), *PEOU* (48.4%), *usage* (55.9%), *satisfaction* (77.5%) and *organisational impact* (24.1%). It is

therefore concluded that, this sub-test B is not improving the overall results of the proposed main conceptual model.

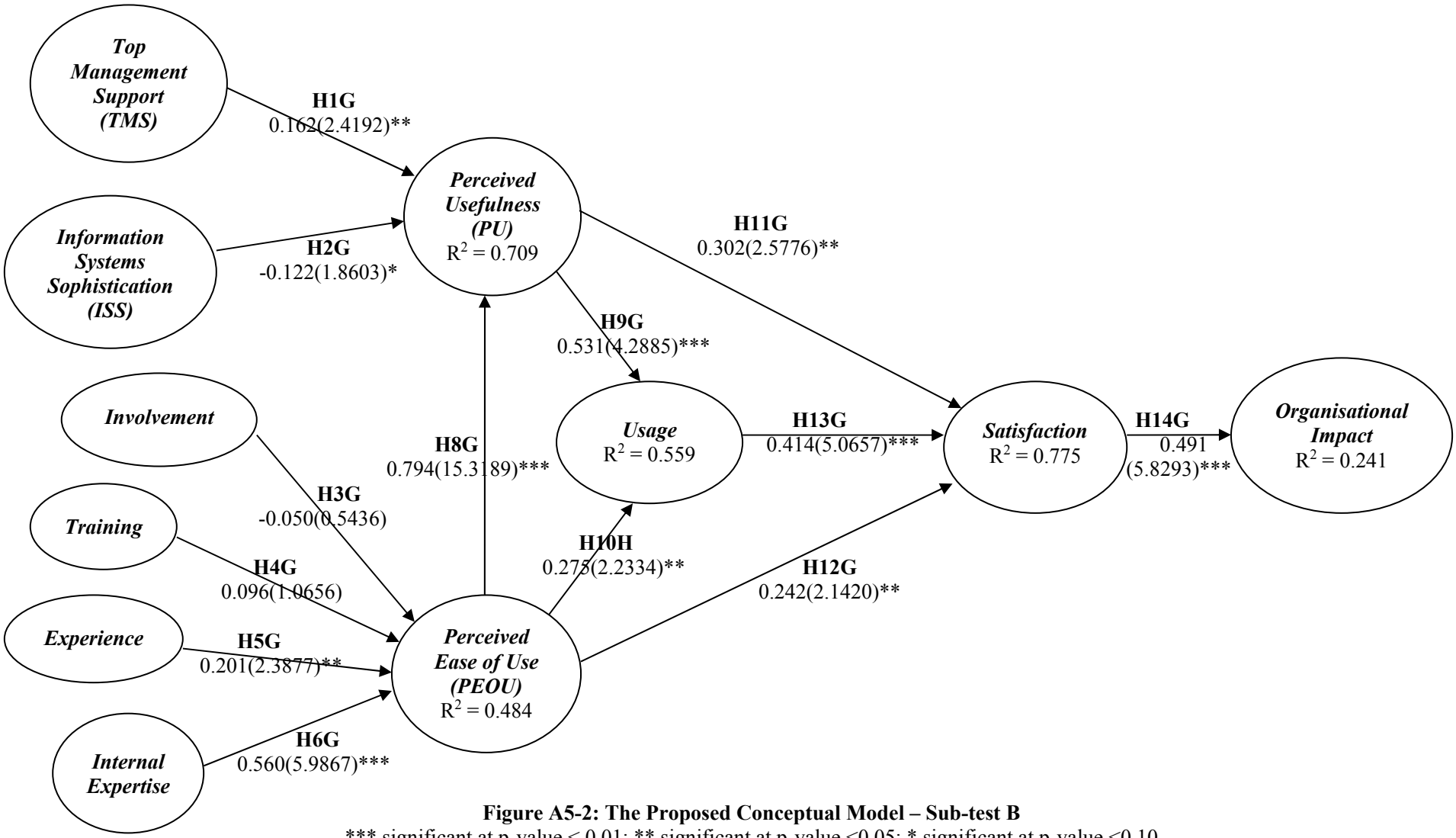

Figure A5-2: The Proposed Conceptual Model – Sub-test B

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

Appendix 5-1C: The Conceptual Model Sub-Test C (*Experience → PU*)

In all previous attempts performed in chapter 6 and also in sub-test A and sub-test B in this appendix, the *experience* construct was situated to link with *PEOU*. The results generated (Table A5.3) were interesting and the relationships show all positive and statistically significance result at p-value < 0.05 except in the sub-test 2 model (H5C) when the relationship was not significant.

Table A5.3: Summary of results for *Experience→ Perceived Ease of Use*

Conceptual model in chapter 6	Beta value	T-value	Sig.	Sig. Level
Main model (H5A)	0.197	2.4214	Yes	0.05
Sub-test 1 (H5B)	0.197	2.4218	Yes	0.05
Sub-test 2 (H5C)	0.056	0.8160	No	-
Sub-test 3 (H5D)	0.195	2.3321	Yes	0.05
Sub-test 4 (H5E)	0.211	2.6751	Yes	0.05
Sub-test A (H5F)	0.179	2.0839	Yes	0.05
Sub-test B (H5G)	0.201	2.3877	Yes	0.05

In this sub-test C, the difference is sought in the results of the paths in the main model when placing the *experience* construct to link with *PU* construct. In this attempt, the result rejects the hypothesis (H5H) when the co-efficient is found to be positive but statistically insignificant ($\beta = 0.128$; $t = 1.6360$). This result is in line with a previous study by Agarwal and Prasad (1999) when they reported insignificant relationship between *experience* and usefulness. The results are presented in Figure A5.3 below.

All other remaining hypotheses are also found to be similar to the results obtained in the previous tests. The R^2 values are also identical to those in previous attempts, except that, the R^2 values for *PEOU* which is found to be lower with only 43.9% as compared to sub-test 4 (in chapter 6) of 47.7%. Other R^2 values are: *PU* (74%), *usage* (55.8%),

satisfaction (77.5%) and *organisational impact* (24.1%). To conclude, this sub-test C does not improve the overall results of the main proposed conceptual model.

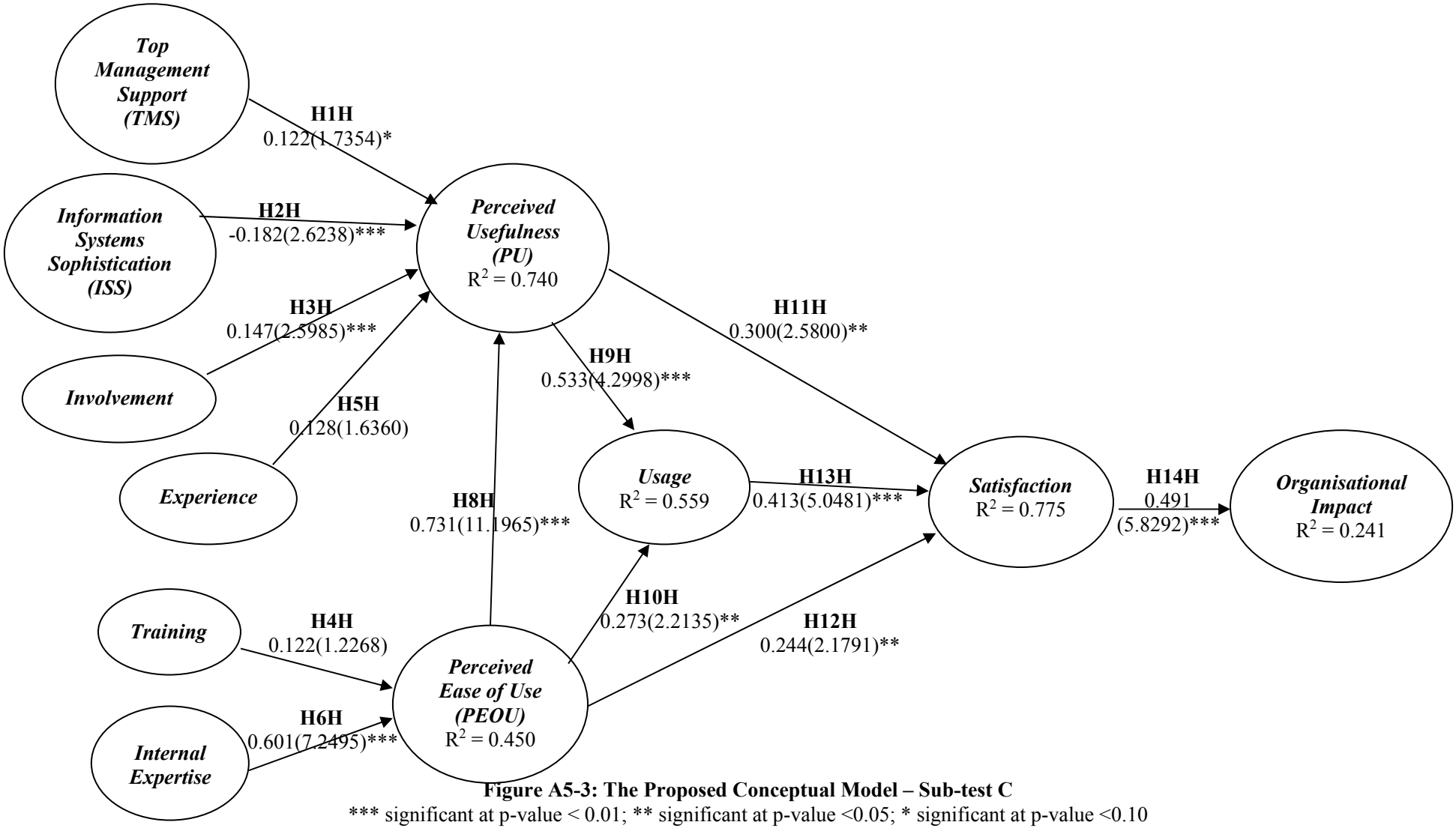

Figure A5-3: The Proposed Conceptual Model – Sub-test C

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10

Appendix 5-1D: The Conceptual Model Sub-Test D (*Internal Expertise → PU*)

In the original conceptual model (Figure 6.3) *internal expertise* was hypothesised to have a relationship with *PEOU* in all attempts performed in chapter 6 and in all the above sections of sub-tests in this appendix (sub-test A, B and C). The results of all the tests are presented in Table A5.4 below. *Internal expertise* resulted in a very strong influence over *PEOU* at $p < 0.01$.

Table A5.4: Summary of results for *Internal Expertise → Perceived Ease of Use*

Conceptual model in chapter 6	Beta value	T-value	Sig.	Sig. Level
Main model (H6A)	0.541	6.6123	Yes	0.01
Sub-test 1 (H6B)	0.541	6.6133	Yes	0.01
Sub-test 2 (H6C)	0.229	2.9688	Yes	0.01
Sub-test 3 (H6D)	0.541	5.0280	Yes	0.01
Sub-test 4 (H6E)	0.580	9.0989	Yes	0.01
Sub-test A (H6F)	0.539	6.62224	Yes	0.01
Sub-test B (H6G)	0.560	5.9867	Yes	0.01
Sub-test C (H6H)	0.601	7.2495	Yes	0.01

This sub-test D changed the position of *internal expertise* to link with *PU* (Figure A5.4). The new test generated a result which is not favourable because the hypothesis (H6J) is rejected. This illustrates that *internal expertise* does not have influence over *PU* in the case of hotel industry in Malaysia.

All other remaining hypotheses are not affected by this test. In terms of R^2 values, the *PEOU* R^2 value is very much affected because it reduced from 48.2% in the main proposed conceptual model (Figure 6.3 in chapter 6) to only 28.3% in this current test (Figure A5.4). The result of this R^2 value can explain the importance of *internal expertise* to impact *PEOU* in this current study. Other R^2 values are similar to those

previously tested. Therefore, it can be concluded that this sub-test D failed to improve the main proposed conceptual model.

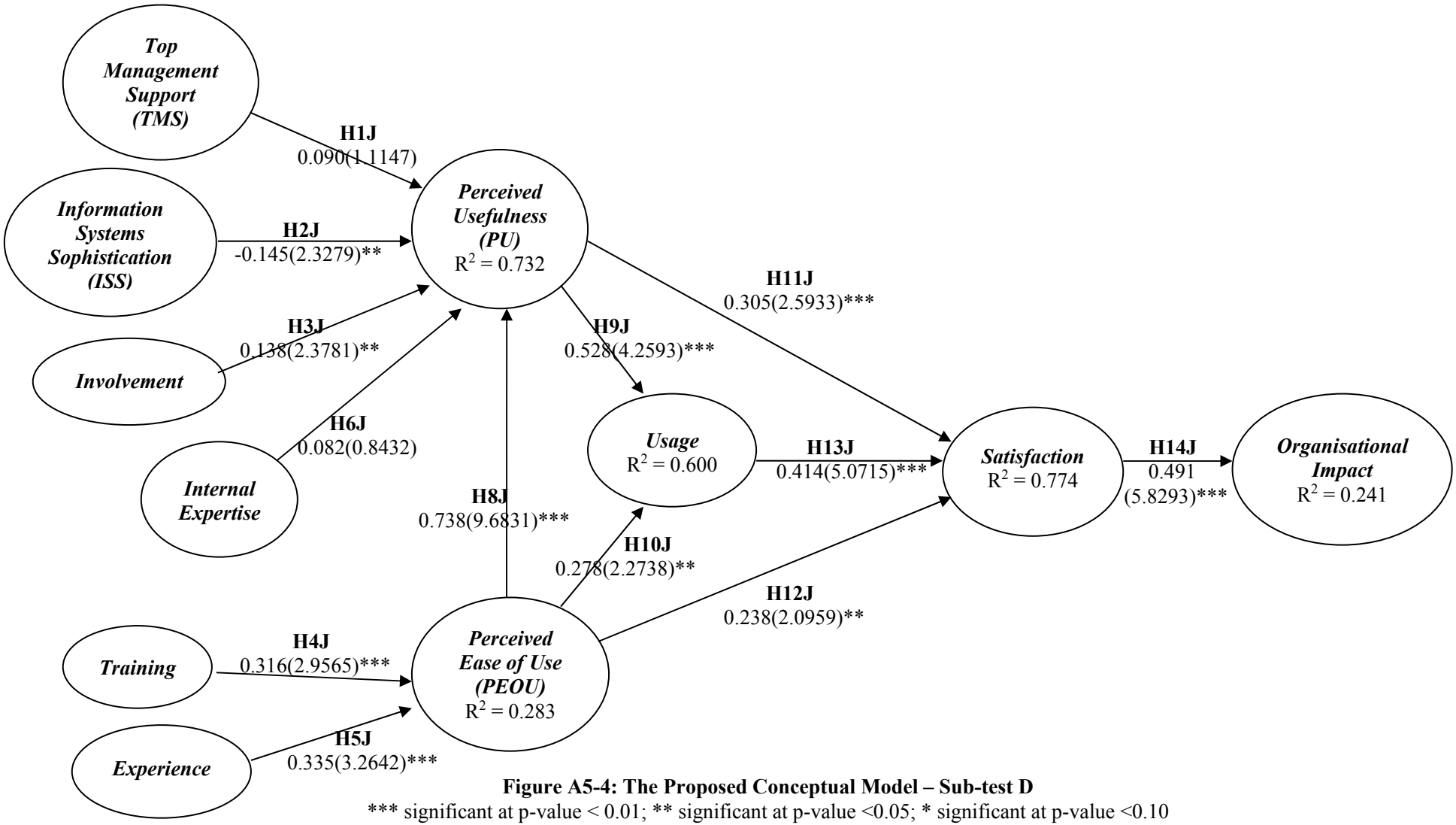

Figure A5-4: The Proposed Conceptual Model – Sub-test D

*** significant at p-value < 0.01; ** significant at p-value <0.05; * significant at p-value <0.10