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The Impact of Information Technology Investment on the Hospitality Industry

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Abstrak

Teknologi informasi semakin berkembang dengan cepat. Hal ini merupakan tantangan spesial bagi para eksekutif senior yang harus memutuskan apakah akan melanjutkan investasi di bidang teknologi baru ataukah tidak. Dilain pihak, pengambilan keputusan ini sering sangat sulit untuk menentukan apakah manfaat nyata apabila melakukan investasi dibidang teknologi informasi dalam sebuah organisasi. Tulisan ini mempertimbangkan pertanyaan ini dalam ruang lingkup industri pariwisata, yang sangat tergantung pada penggunaan teknologi informasi dalam kegiatan operasionalnya sehari-hari. Lebih khusus, penelitian ini menginvestigasi hubungan diantara investasi teknologi informasi, penggunaan teknologi informasi, kepuasan pengguna komputer, kinerja pengguna komputer dan kinerja hotel.

Sebuah survey terhadap 945 EUC (computer end-user) yang bekerja di beberapa hotel di Bali, Indonesia telah dilakukan untuk menilai persepsi mereka tentang dampak teknologi informasi pada sebuah organisasi. Hasilnya menunjukkan bahwa ada hubungan yang signifikan diantara kelima variabel yang diinvestigasi. Lebih lanjut, telah diketemukan bahwa level investasi dibidang teknologi informasi dan level kinerja user secara langsung dapat mempengaruhi kinerja hotel, akan tetapi jumlah penggunaan teknologi informasi dan level kepuasan user dapat mempengaruhi kinerja hotel secara tidak langsung melalui level kinerja user. Dilain pihak, kepuasan user juga diketemukan memiliki pengaruh yang sangat kecil terhadap kinerja hotel. Level investasi dibidang teknologi informasi memiliki hubungan yang signifikan dengan level kepuasan user, dimana diketemukan pula secara langsung mempengaruhi jumlah penggunaan teknologi informasi. Yang tidak kalah penting adalah investasi dibidang teknologi informasi diketemukan memiliki pengaruh secara langsung terhadap penggunaan teknologi informasi dan kinerja user di beberap hotel. Penemuan ini menyarankan bahwa generalisasi di beberapa organisasi yang akan melakukan investigasi pengaruh investasi teknologi informasi terhadap kinerja organisasi, dan hal ini tidak dapat diabaikan.

Kata kunci: information technology, organization performance, hospitality industry.

1. Introduction

The use of the information technology (IT) and its impact in organizations has received much attention in the literature. During the last few decades, organizational investment in IT has increased dramatically. Willcocks (1994) estimated that in the 1980s, IT investment by user

organizations had an annual growth rate of nearly 15%. The underlying growth trend in IT expenditure has continued in the 1990s, in spite of economic uncertainty.

This is because many senior executives believe that IT can improve not only the operational efficiency of their business but also their strategic advantage over competitors. Add to this is the fear of being "left behind" by their competitors, if their own organizations do not invest substantially into IT. Unfortunately as pointed out by Weill (1992), much of this investment was often made on the basis of faith rather than a real understand of the returns in IT investment. In the current economic climate, many are beginning to question the real benefit of continuing information technology investment to the organization. This research is an attempt to investigate the evidence for a relationship between IT investment and organizational performance.

In this study we focus our attention on the hospitality industry, which is becoming increasingly competitive. The hospitality industry is of particular interest because of its need for customer-focused and it's reliance on technology to obtain customer-related information. Computers or network of computers are used to make immediate reservations on accommodation and transportation at short notice; change or cancel requests; provide quotes on complex fares and conditions of travel; process transaction documents; generate accounting and operational reports, and provide critical managerial and planning information to decision makers.

Information technology is having and will continue to have a profound impact on the hospitality and tourism industry in terms of its operations and the structure of the industry. Consumer preferences and loyalty are strongly influence by service quality and responsiveness to customer/market demands. The ability of the organization to meet these challenges is very much dependent on the information capability of the organization.

A number of studies have been conducted on the relationship between information technology and organizational performance (Strassmann, 1985; Turner, 1985; Cron & Sobol, 1983; Bender, 1986; Weill & Olson, 1989; Banker et al., 1990; Harris & Katz, 1991; Weill, 1992; Power & Dent-Micallef, 1997), however a clear picture of the relationship between IT investment and hotel performance still requires further investigation. It appears that the effect of IT investment on hotel performance is mediated through a number of "user-related" organizational variables such as information technology usage, user (employee) satisfaction, and user (employee) performance. Parthasarthy and Sethi (1993) have reported the possible existence of moderators in the IT-performance relationship. The moderators included business strategy, cost leadership, quality leadership, flexibility, mechanistic-organic structural variables, and manufacturing structure. As this study is concerned with the impact on hotel performance, we shall consider factors used which will affect the utilisation of IT in the organisation, the employee attitude toward IT and the resultant employee performance. Three moderators are being included: information technology usage, user satisfaction and employee performance. The importance of IT usage, user satisfaction and employee performance have been studied extensively (Barki & Hartwick, 1994; Gatian, 1994; Cavaye, 1995; Igbaria & Tan, 1997; Lu & Wang, 1997). They have reported, if users are satisfied with information technology provided by organisation, will lead to higher level effectiveness which is expected to positively influence both users and organisation performance. Gatian (1994) also argued that user satisfaction (US) is often used as a surrogate measure of information system effectiveness. If an effective system is defined as one that adds value to the firm, then an effective system must have some positive influence on employee performance such as improve productivity and decision making quality. Delone & McLean (1992) proposed that user satisfaction affects employee performance. It is proposed that users who are more satisfied with the system will report a greater level of individual impact on their job performance. The exact nature of their inter-relationship has not

emerged from previous studies. Therefore, the purpose of this study is to study how IT investment may impact on hotel performance and how they are related to the three user-related organizational variables mentioned here.

This paper has been organized into seven sections. The first section (this one) is a general introduction to the entire paper. It is followed by a description of the background to the research where related research findings in the literatures are examined. The third section provides the theoretical framework to this investigation, where the research hypotheses and the research variables are described. Section four is on the method used in this study explaining the survey instrument, survey procedure and the subjects. Data analysis is reported in the fifth section where issues relating to response rate, demography of the sample group and the reliability of the scales are discussed. In section six, the structural equation model was used to explore the relationships among the five research variables. The paper concludes with a discussion on the implications of the research findings and possible future research directions.

2. Background to the Research

It is often argued that higher IT investment will result in better organizational performance. However, in his study, Roach (1988) concluded that there is very little convincing evidence that investment in IT generate positive financial returns. Other similar studies also found a lack of persuasive evidence that IT investments created strong leverage on the value of the firm (Kauffman & Weill, 1989). Why are these research findings so different from expectation? Is the expectation false? Or is it because the research tools used were not sufficiently discriminating to separate the effects of IT investment from other factors that impact upon the firm's performance? (Weill, 1992). The problem of lack of convincing evidence is not confined to questions on IT investment but it is common to much research on the general impact of IT. Unfortunately research literatures do not give reliable generalizations about the relationships between IT and organizational changes (Markus & Robey, 1988).

A number of studies have been conducted on the relationship between investment in IT and firm performance with positive results. Bender (1986), for example, found a positive relationship between organizational IT investment and the performance of the firms. In his study of the insurance industry, he concluded that there is an optimum level of investment in information processing indicating that optimum performance is achieved at a range of investment in IT from 15% to 25% of the total operational cost of the firm. Another study of the insurance industry (Harris & Katz, 1991), using four years of historical data, revealed that firms with the most improvement in organizational performance allocated a significantly higher proportion of their operating expenses to IT.

Some studies found that the relationship IT investment and firm performance was complex and dependent on many other factors. In a study of warehousing companies Cron & Sobol (1983) concluded that firms that make extensive use of computers have either very strong or very weak financial performance. This finding highlights the need to consider other intervening factors, which may have been missing in their analysis.

Banker et al. (1990) studied the use of point-of-sales and order management technology in Hardee's fast food stores. In the 89 stores included in the study, approximately half had introduced the new technology. Those stores with the technology and large breakfast sales (with the more complex menu for breakfast) performed significantly better than the other outlets in terms of materials costs. In this case, IT was effective in cutting costs among those stores with the more complex tasks.

Powell & Dent-Micallef (1997) found that IT alone has not produced sustainable performance advantages in the retail industry. But some firms have gained significant

advantages by using IT to leverage intangible, complementary human and business factors such as flexible culture, strategic planning with IT integration, and supplier relationships to improve performance.

On the other side of the coin, there are a number studies which found no significant relationships. In a study of 58 banks, Turner (1985) reported that no significant relationship was found between organizational performance and the relative proportion of resources allocated to data processing. Likewise Strassmann (1985) in his study of firms in the service sector, found no significant relationship between high performing firms and the level of IT investment.

3. Research Framework

The primary aim of this investigation is to examine the impact of the organization's investment in IT on organizational performance in the hospitality industry. As mentioned earlier, previous studies suggested that the relationship between these two variables is rather complex. It may include a direct relationship as well as an indirect relationship mediated through other variables. For the purpose of the present study, we have chosen three other user-related organizational variables, viz. information technology usage in the hotel, hotel employee/IT user satisfaction, and hotel employee/IT user performance. While other variables may also have some influence on hotel performance, our survey of the literatures suggested that these three are most likely to play a significant role in this study of the relationship between IT investment and hotel performance. We propose a model as depicted in Figure 1 below showing the inter-relationship among the five variables under consideration, and formulated six hypotheses.

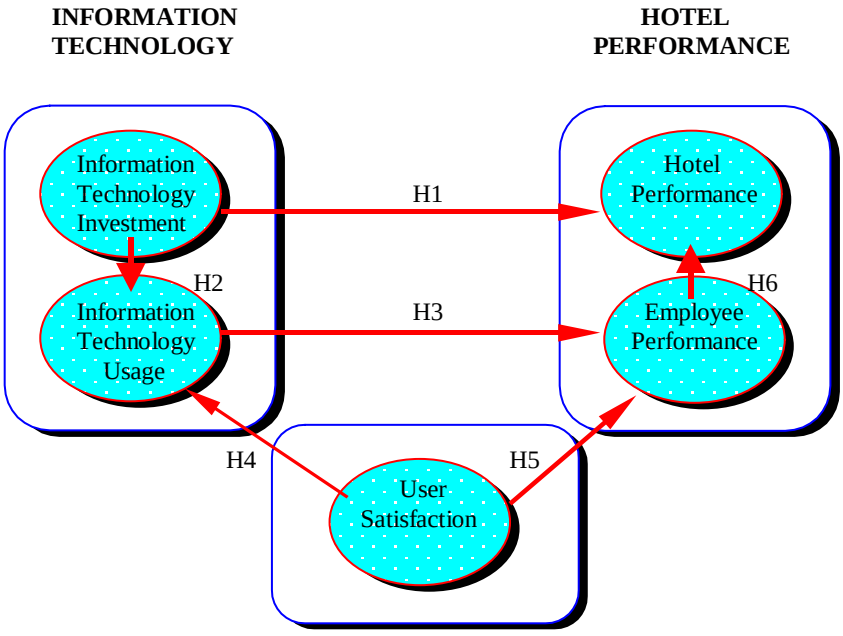

Figure 1. Theoretical framework

The first hypothesis addresses the main aim and objective of this study. The remaining hypotheses explore the inter-relationship in more detail to show the manner in which information technology investment by the hotel may impact upon the hotel's performance. As

the objective is to discover relationships among the variables, all hypotheses will be stated in positive terms. (The associated null hypothesis is simply the denial of the relationship.)

Hypothesis 1: The level of IT investment by a hotel has a positive impact on the level of hotel performance.

Investment in IT alone does not necessarily lead to better hotel performance, if the hotel employees do not use (for whatever reason) of the IT facilities or if they do not utilise them correctly or efficiently. Therefore information technology usage (IT usage) is a crucial intermediate factor in the value chain if an organisation wishes to realise the potential benefit of IT in the organisation. This leads to our second hypothesis.

Hypothesis 2: The level of IT investment by a hotel is has a positive impact on the amount of IT usage by the end-user employees in the hotel.

The third hypothesis is based on the belief that if the information technology facilities in an organisation are utilised correctly and efficiently, the ability of the user-employees to perform their required functions in the organisation will improve.

Hypothesis 3: The amount of IT usage by end-user employees has a positive impact on the level of employee performance.

The next question to ask is what else may influence information technology usage in an organisation. Researchers generally agree that user satisfaction with the organisational computer information system has strong bearing on IT usage by employees (Baroudi et al., 1986; Davis et al., 1989; Gatian, 1994; Igbaria and Tan, 1997). IT user satisfaction will also impact upon user performance in the organisation (DeLone and McLean, 1992). This leads to the next two hypotheses:

Hypothesis 4: The degree of user-employee satisfaction with the IT facilities has a positive impact on the amount of IT usage in the organisation.

Hypothesis 5: The degree of user-employee satisfaction with the IT facilities has a positive impact on the level of employee performance

To complete the value chain in linking IT investment with hotel performance, we added the following hypothesis:

Hypothesis 6: The level of employee performance positively affects the level of hotel performance.

The complete proposed model, incorporating all 6 hypotheses, is illustrated in Figure 1.

3.1 Measurement of Key Variables

The five variables considered in this study are information technology investment (ITI), information technology usage (ITU), user satisfaction (US), employee performance (EP) and hotel performance (HP). These five variables are measured using an instrument which assesses the employee's perception on each of this dimension. While three of the variables, viz. ITU, US and EP, present no problem, to ensure objectivity, with respect to the two main variables: ITI and HP, cares were exercised to select subjects that include employees in the management team who have accurate knowledge of these two indicators. Furthermore, where available and permissible, company records are search to verify the accuracy of the collected data. It was found that in the current study, the statistics collected do agree with the findings of from the survey instrument.

3.2 Information Technology Investment

To measure information technology investment, it is not sufficient to consider the total cost of investment in IT equipment. There are many other costs associated with the support and operation of IT facilities. In this study four components have been identified. These are: computer hardware cost; computer software cost; cost of training IT users; and cost of supporting IT users. Each item was measured on an 11-point Likert scale ranging from (0) “not at all” to (10) “extremely large”. An 11-step scale was chosen as it was claimed by Nunnally (1978) that "in terms of psychometric theory, the advantage always is with using more rather than fewer steps”.

3.3 Information Technology Usage

A number of researchers (Igbaria et al., 1989; Soh et al., 1992; Straub et al., 1995; and Igbaria & Tan, 1997), have developed instruments to measure information technology usage. All of these scales have a reliability Alpha value of 0.7 or above. From their works, we have chosen six measures to be used in this study: (i) frequency of use; (ii) time of use; (iii) criticality of IT usage; (iv) feeling of IT usage; (v) number of business tasks for which the system was used by employees; and (vi) number of computerized applications used by employees.

A mixture of semantic differential scales and Likert-type scales was used to record responses to our survey questions. Alreck and Settle (1985:) claimed that the major advantage of the semantic differential scale is “its ability to portray images clearly and effectively”. Again an 11-step scale was used for the Liker-type scales.

The number of tasks involving the computer was used as an indication of IT usage. Sixteen tasks (e.g. project planning, budgeting, writing reports, scheduling meetings, communication with others, decision making, accounts payable, accounts receivable, cash/portfolio management, general ledger accounting, integrated accounting, job costing, order entry, customer records, payroll, personnel management) were included in the survey where a yes/no response was requested. Provision was made for the respondent to indicate "other" types of task. The total count on the number of tasks was used as the measurement indicator.

In terms of the variety of applications used, the questionnaire listed sixteen different types of software applications, for example: spreadsheet, word processing, work scheduling, database management, electronic mail, graphics, project management, programming, world wide web, chat, on-line-games via Internet, wireless access, newsgroup, telnet, and file transfer

protocol. The subject, were asked to indicate what applications were actually used in their workplace. Again respondents were given opportunity to indicate other applications.

3.4 User Satisfaction

In the present context, we are interested in the employees' attitude as they function in the role of computer end-users in performing their organisational duties. A 12-items scale developed by Doll and Torkzadeh (1988), with Alpha = 0.8, was used to measure user satisfaction. The scale was a measure of overall user satisfaction that includes a measure of the satisfaction of the extent to which computer applications meet the end-user's needs with regards to information content, accuracy, timeliness, format and ease of use. Each item was again measured on an 11-point Likert scale ranging from (0) "almost never" to (10) "almost always".

3.5 Employee Performance

Employee performance is measured based on a scale developed by Igbaria and Tan (1997) (α = 0.8). What is being measured here is the improvement (or the lack of it) in four performance indicators as a result of the use of IT. The four variables (i) productivity on the job; (ii) job performance; (iii) effectiveness on the job; and (iv) decision making quality. Each item was measured on an 11-point Likert scale.

3.6 Hotel Performance

Recognising that organisational performance is a complex and multidimensional phenomenon, we acknowledge that any finite set of measures for hotel performance is likely too simplistic (Galbraith and Schendel, 1983). In this case, financial indicators alone is not sufficient to capture the broad scope of hotel performance (Jeffrey and Hubbard, 1994) In this study three different global measures were chosen, namely; (1) hotel financial performance; (2) occupancy room/rate; and (3) the number of visitors. This provides measures in occupancy and visitation measures as well as financial measures of performance. Following the format in other parts of the instrument, each item was measured on an 11-point Likert scale ranging from (0) "not at all" to (10) "extremely large"

4. Method

The approach employed in this study follows the standard survey research paradigm. Having formulated a number of hypotheses describing the relationships among the various variables under consideration, a survey questionnaire was developed. After pilot testing, the instrument was administered to a group of subjects. The data were analysed using accepted statistical techniques to test the hypotheses. In this section, a brief description of the characteristics of the sample group, the survey instrument and the survey procedure is given.

4.1 Subjects

The target population consisted of hotel employees who routinely used IT in the performance of their daily duties. This include a variety of employees ranging from those working at the front counters to those working at the back offices as well people in the higher management hierarchy. As mentioned earlier, the hospitality industry was selected because of its increasing reliance on IT and the interests of the present researchers.

The particular location in which the survey was conducted was in Bali, Indonesia. Bali is a well-known international tourism destination, with visitors coming from all over the world. Even in the current Asian economic crisis, Bali is still able to compete in the international tourism market place. However, Tourism Industry Planners in Bali recognise that in order to maintain a competitive position in the international arena, the industry must leverage the capabilities of new IT. This study is expected to provide timely information.

Subjects were all employees of 5- and 4-star hotels in Bali. They were chosen rather than those in lower ranking hotels because typically these used more information technology rather than the later group. Furthermore the 5- and 4-star hotels are more likely to be connected to the Internet or their corporate wide area networks (WAN) to provide linkage with international hotel chains. A large proportion of employees in these hotels was supplied with a personal computer (PC) at work. It was found that all PCs and minicomputers in the hotels surveyed in this study were connected to the corporate computer network, either a traditional LAN or an Intranet. In addition to standard hotel reservation and accounting software, employees used a variety of computerised applications such as electronic telephone directory, specialised application systems, electronic scheduling, electronic mail etc.

4.2 Survey Instrument

The survey package sent out to the subjects consists of a four-pages questionnaire, a covering letter, a guideline to filling the questionnaire, and a letter of introduction from the Director of the Bali Department of Tourism, Post and Telecommunication.

The questionnaire is divided up into six sections. In the first section, demographic information such as age, gender, marital status, position in hotel, educational background, and individual income level were sought. In this study this data was used to identify the characteristics of the subjects only. The question on whether there is any difference in the subject's perception for different demographic groups will be considered in a separate paper. The remaining five sections are devoted to measuring the perception of the subjects on the five variables under consideration, viz. ITI, HP, ITU, US and EP. Table 1 summarises the structure of the questionnaire.

Table 1. Structure of questionnaire

Section	***What does it measure?***	***Number of items***
1: DEMO	Demographics	7
2: ITI	Information technology investment	5
3: HP	Hotel performance	3
4: ITU	Information technology usage	6
5: US	User satisfaction	12
6: EP	Employee performance	4

The instrument was pilot tested to improve its quality. Four criteria were considered this pilot testing process: clarity of the questions, comprehensiveness of the coverage, time taken to complete the questionnaire and the ease of answering the questionnaire. A 2-stage process were used. The pilot test was first conducted with a small group of Business graduate students at Southern Cross University. In the second stage the raft questionnaires was administered to 10 employees in two motels in Lismore and one 5-star hotel in Gold Coast. All 10 employees used computers in their daily duties. Based on the feedback from the pilot surveys, the questionnaire was modified to improve its clarity and readability.

4.3 Survey Procedures

To enhance the likelihood of success in the survey phase of this research, the support of the Bali Department of Tourism, Post, and Telecommunication was obtained. In fact, the Director of the Department agreed to write a letter of recommendation on behalf the researchers expressing his approval of the project and encouraging potential respondents to participate in the survey. As a result, we were not only able to claim official sanction and legitimacy for the research (thus improving the response rate); we were also able to obtain some very useful demographic information from the Department to assist with the data collection process. This included the number of 5 & 4-star hotels in Bali, their addresses, phone and facsimile numbers, the names of the hotel general manager, the number of employees, and the number of rooms in each hotel.

The letter of recommendation from the Director of Bali Tourism, Post and Telecommunication was sent to General Managers of all twenty-eight 5 and 4-star hotels in Bali. This was followed up with a telephone contact, during which the purpose of the research was explained. At the same time permission was sought from the General Managers to conduct a survey in their hotels. It was made clear to the General Manager that only those employees who use computer(s) in their daily duties will be asked to participate in the survey. If the General Manager agreed, then a formal appointment was made with respect to the exact time of the delivery and collection of survey forms. The support of the hotel General Managers was a crucial factor to ensure good response.

Twenty out of the twenty-eight hotels were willing to participate in the study representing 71% of the population group (in hotel counts). The reasons given by the non-participating hotels included a variety of reasons. For example: they were not able to provide meaningful data due to the lack of proper computing resources in their own hotels; the hotels were in the processes of updating their information and communications technology capabilities at present therefore it was not a convenient time; and they are not interested because of the current economic conditions in Indonesia.

Questionnaires were hand delivered to all hotels. Hotel General Managers whose had agreed to participate were urged to strongly encourage their employees to complete the questionnaire. As an incentive, a souvenir key-ring from Australia was offered as a gift to all those employees who have returned a completed questionnaire. In total 1,131 questionnaire forms were distributed. To ensure that only the targeted subjects participate in the survey, it was requested in the covering letter that, the survey should be completed only by hotel employees who use Information Technology in their daily operation, both top and middle management.

In an attempt to check and verify the accuracy of the questionnaire responses, personal interviews were also conducted with selected employees from each hotel. For the smaller hotels, 1 person was interviewed. But for the larger hotels, up to 5 employees were interviewed in this verification process. Useful clarification relating to the hotel IT investment and hotel performance was obtained during these interviews.

5. Data Analysis

5.1 Questionnaire Response Rates

Twenty of the 5 & 4 - star hotels in Bali that participated in this research, employ a total of 11,529 employees. Of these 1,131 or approximately 10% used Information Technology in their daily operation. They may be considered computer end-users. As mentioned in the previous paragraph, 1,131 questionnaire forms were distributed to these potential subjects. 945

completed forms were returned, representing a response rate of 83%, which may be considered an acceptable level of response in this type of research. Table 2 shows the hotels that participated, the number of employees in these hotels, and the number of completed questionnaire forms returned to the researchers after two weeks.

Table 2. Questionnaire response rates

No	*Hotel*	*Star Level*	*Total Employees*	*IT end-user employees*	*Question-naires returned*	*Percen-tage of returns*	*Number of interviews*
1	The Grand Bali Beach	5	985	90	80	88.9 %	5
2	Bali Hyatt Hotel	5	804	78	61	78.2 %	4
3	Bali Intercontinental	5	784	80	60	75.0 %	4
4	Kartika Plaza	5	773	70	55	78.6 %	4
5	Nusa Dua Beach	5	758	76	60	78.9 %	4
6	Nikko Bali	5	751	75	71	94.7 %	4
7	Sheraton Nusa Indah	5	717	100	78	78.0 %	5
8	Sanur Aerowisata	5	708	55	35	63.6 %	3
9	Bali Padma Hotel	5	693	60	56	93.3 %	3
10	Melia Bali Sol	5	670	70	62	88.6 %	4
11	Putri Bali	5	628	40	36	90.0 %	2
12	Bintang Bali Resort	5	592	55	50	90.9 %	3
13	Four Season Resort Bali	5	580	60	55	91.7 %	3
14	Patra Jasa Bali	5	418	40	32	80.0 %	2
15	Bali Cliff Resort	5	386	40	35	87.5 %	2
16	Dynasty Resort	4	309	30	28	93.3 %	2
17	Holiday Inn	4	292	30	25	83.3 %	2
18	Bali Oberoi	4	234	30	24	80.0 %	2
19	Natour Kuta Beach	4	227	27	22	81.5 %	1
20	Novotel Benoa Bali	4	220	25	20	80.0 %	1
	Total/Average		**11,529**	**1,131**	**945**	**83.6 %**	**57**

5.2 Descriptive Statistics

The demographics of the respondents in this survey are summarised in Table 3 and Figure 2.

Table 3. Some demographics on the respondents

Age	*Frequency (percentage)*	*Position in hotel*	*Frequency (percentages)*	*Educational level*	*Frequency (percentage)*
< 18	3 (0.3%)	Accounting/Finance	256 (27.1%)	Higher School	281 (29.7%)
18-24	83 (8.8%)	Front Office	165 (17.5%)	Diploma	398 (42.1%)
25-30	352 (37.2%)	Human Resources	111 (11.7%)	Bachelor degree	213 (22.5%)
31-40	316 (33.4%)	Information Systems	109 (11.5%)	Master	32 (3.4%)
41-55	177 (18.7%)	Marketing	111 (11.7%)	Doctorate	0 (0 %)
> 56	14 (1.5%)	Others	193 (20.4%)	Others	21 (2.2%)
Total	945 (100%)	**Total**	945 (100%)	**Total**	945 (100%)

As might be expected, the majority of respondents (37.2 %) were between the ages of 25-30 years old. This age group typically consists of young workers who are generally highly susceptible to the introduction of information technology into the workplace environment. The second largest group (33.4 %) was employees in the range 31-40 years of age, who are still consider young but probably have been in the hospitality industry a bit longer. In total, 70.6 % of the respondents fall in the age range of 25 - 40. The mean age of the respondents was 34.

As shown in Figure 2, the majority of the respondents, 64%were male and only 36% were female.

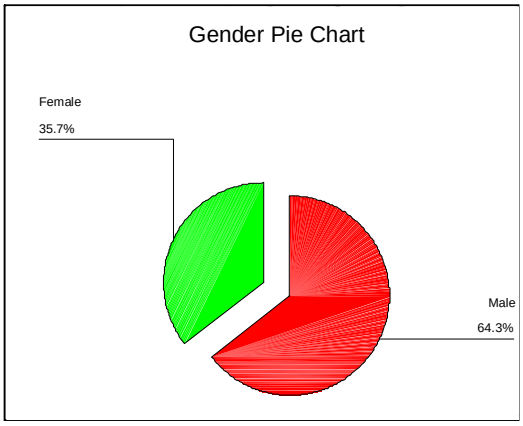

Figure 2. Pie chart of gender

Table 3 also provides information on the educational levels of the subjects. Over two-thirds of the hotel employees participated in this survey (68 %) has at least either a tertiary diploma or an university degree. Some 30 % has only completed higher school education.

In term of the nature of employment of these respondents, 256 or 27 % were working in the accounting and finance sections of the hotel, showing that this section is probably the most computerised department in most hotel. The second largest group of 165 subjects, or 17.5 % worked in the front office. It was interesting to note that a significant proportion (20.4%) of the respondents worked in others departments such as engineering, executive office, banqueting, food and beverage, kitchen, laundry, housekeeping, material, and time keeping.

5.3 Reliability of the Scale

The reliability of the total questionnaire and the five subscales was assessed using the Cronbach's alpha coefficient, which is the most widely used index for determining internal consistency (Cronbach and Meehl, 1981; Kerlinger, 1986). The actual alpha values are shown in Table 4 below:

Table 4. Cronbach's alpha coefficient of this study

Name of Subscale	***Variable Code***	***Reliability (Cronbach's Alpha)***
Information Technology Investment (ITI)	ITI1 - ITI5 (5items)	0.9382
Hotel Performance (HP)	HP1 - HP3 (3 items)	0.9203
Information Technology Usage (ITU)	ITU1 - ITU6 (6 items)	0.9343
User Satisfaction (US)	US1 - US12 (12 items)	0.9703
Employee Performance (EP)	EP1 - EP4 (4 items)	0.9384
ENTIRE QUESTIONNAIRE	All 30 items	0.9387

Cronbach's alpha has been found to be a lower bound to the true reliability, i.e. alpha is a conservative estimate of the reliability of the scale (Armor, 1974 as quoted in Guimaraes and Igbaria, 1994). It has been suggested that in the early stages of research on hypothesized measures of a construct, reliabilities of 0.70 or higher are adequate (Nunnally, 1978 as quoted

in Guimaraes and Igbaria, 1994), whereas for widely used scales, the reliabilities should not be below 0.80 (Carmines and Zeller, 1979). In this study, the computed alpha coefficients as shown in Table 4, were all considered adequate since they all exceed 0.90. The high alpha value of all five subscales confirms the homogeneity of the items comprising them, and indicate acceptable levels of reliability.

6. Relationships Among Research Variables

In this final section, the relationships among the five research variables will be examined. The ultimate objective is to determine whether information technology investment by the hotel will have an impact on the hotel performance. However, this it is necessary to consider not only the direct impact, but also the *indirect* impacts through the other three user-organizational variables included in this study. The standard techniques in such analyses were factor analysis and multiple regression. They were used in the initial exploratory analysis to reveal the relationships among the variables under consideration. However, in the final analysis the Structured Equation Model (SEM) (Bollen, 1989) as implemented in the SPSS Amos software tool (Arbuckle, 1997) was used.

6.1 Structural Equation Model

SEM techniques allow the relationships between different variables to be explored. The variables may be observed variables or latent variables. The approach is similar to performing a factor analysis of the scale items and then using the factor scores in regression analyses to explore the relationship between factor constructs. SEM also offers some important additional benefits over the factor-regression techniques including an effective way to deal with multicollinearity, and methods for taking into account the unreliability of subject response data (Hair et al., 1995; Bacon et al., 1997).

Figure 3 shows Amos's path diagram for the final model involving the five latent variables under consideration. In this diagram, the three latent variables "information technology usage (ITU)", "hotel performance (HP)", and "employee performance (EP)" was modelled as endogenous (dependent) variables while the two latent variables ITI (Information Technology investment), US (user satisfaction) was modelled as exogenous (independent "predictors") variables. The error terms "er33", "er32" and "er28" are the residuals for the three endogenous variables. The co-variation between the predictors is also modelled.

A Confirmatory Factor Analysis (CFA) was conducted with Amos to assess construct validity of the five latent variables. Indicated in the Amos diagram is the dependence of the five latent variables on the observed item measures. Thus, IT investment has five items, IT usage has six, user satisfaction has twelve, employee performance has four, and hotel performance has three. In order to assess the validity of these measures, Bollen (1989) suggests examining the λ values (factor loadings) and the squared multiple correlations between the items and the constructs. As shown in the figure, significant loading for each item on its hypothesized construct ($p < 0.01$ in all cases) was found. In addition, there was little variance in the λ values within each construct, indicating that the items tended to contribute equally to the formation of the construct. Squared multiple correlations between individual items and the constructs were generally high. Finally, the values for internal consistency suggest that the measures are reliable. All of the scales were above 0.9.

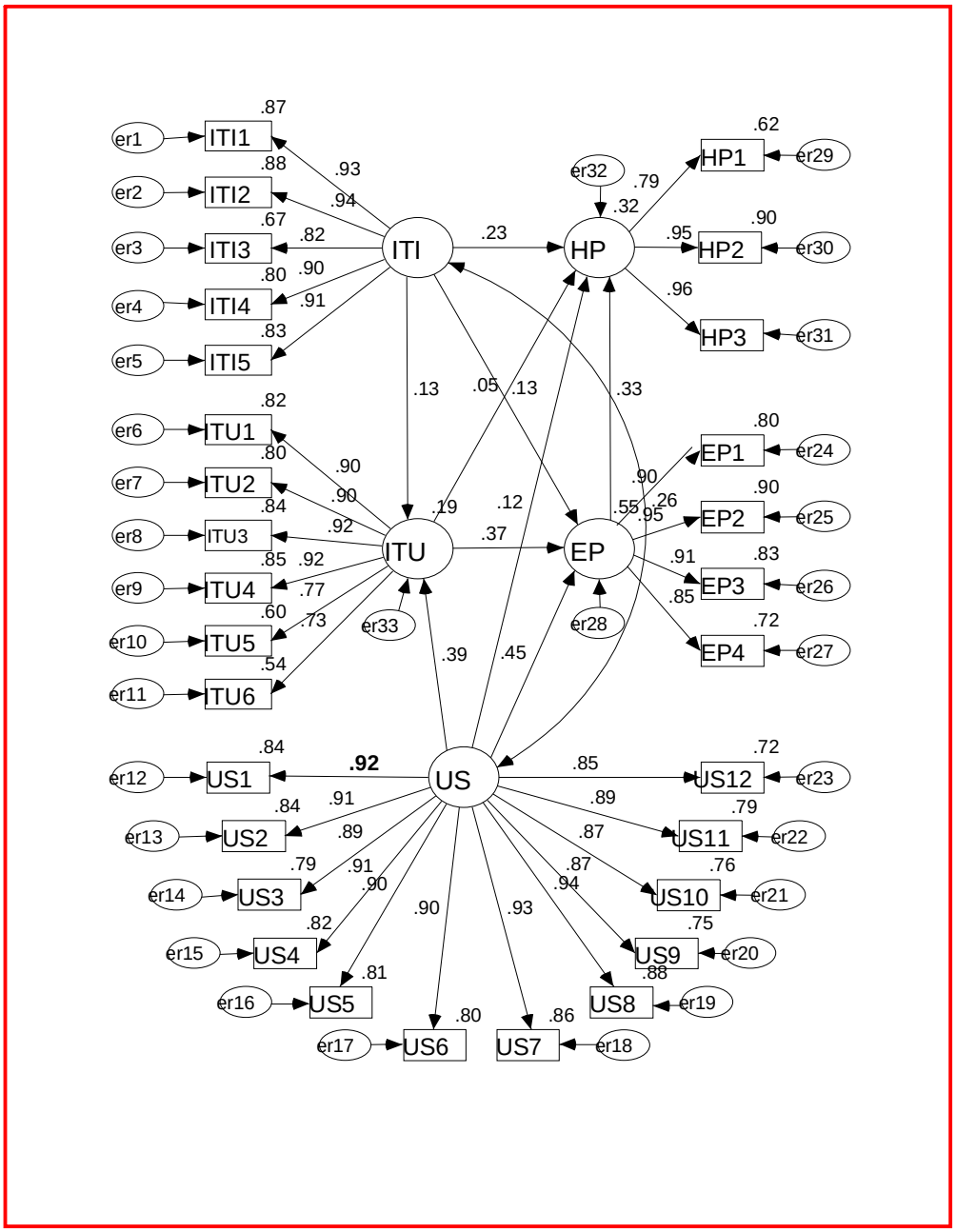

Figure 3. Final path diagram for this study

To assess the model, multiple fit indicators are examined. As the traditional χ^2 test has been recognized as an inappropriate test for large sample sizes (Browne and Cudeck: 1993, Marsh: 1994), three other indices are also included: the AGFI (Adjusted Goodness of Fit Index) (Joreskog and Sorbom, 1993), the RNI (Relative Non-Centrality Index) (McDonald and Marsh, 1990), and the RMSEA (Root Mean Square Error of Approximation) (Steiger, 1990) Acceptable model fits are indicated by values of: AGFI exceeding 0.80, RNI values exceeding 0.90 (Marsh, 1994), and RMSEA values below 0.08 (Browne and Cudeck, 1993). The data were generally consistent with our hypothesized structure with the no significant χ^2

value = 1720 ($p < 0.01$). The other three fit statistics, AGFI, RNI, and RMSEA were computed for this set of data and found to have the following values AGFI = 0.957; RNI = 0.92; and RMSEA = 0.060. This indicates an acceptable level of fit for the proposed model.

6.2 Results

What does the structural equation model tell us about the inter-relationships among the five latent variables: ITI, ITU, US, EP, and HP? How do these relationships relate to the six hypotheses proposed in Section3? A close examination of the SEM diagram reveals that the path coefficients among the five latent variables fall into 3 groups: those that have a reasonably high values (0.33 or above), those that have a moderate values (0.23 to 0.26), and those that have a low but significant level (0.13 or lower). Figure 4 attempts to capture this relationship model in a more succinct way. The three groups of paths have been represented by a thick, thin and dash line respectively. There was another path from ITU to HP but the path coefficient was too small (0.05), and hence was not included in Figure 4.

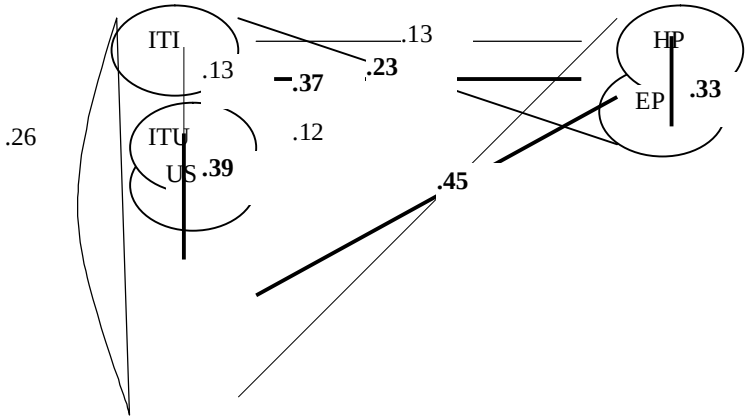

Figure 4. Relationship model showing the impact of IT Investment on Hotel Performance

Results obtained from the structural equation model, indicated that all hypotheses cannot be rejected, as all six proposed relationships among the latent variables were found to be significant. Figure 4, summarises the key feature of the relationship model resulted from the survey data.

Demonstrated in figure 3, however the results indicated that there were too small relationships. There was much factor affect hotel performance, such as climate of economic, political condition, etc.

Consistent with the researcher expectations, user satisfaction and information technology usage was all positively related to user performance. The data show that perceived user satisfaction has the strongest direct effect on user performance ($\beta = 0.45$, $\rho < 0.001$). It should also be noted that user satisfaction also has an indirect effect through information technology usage. The contribution of information technology usage to user performance ($\beta = 0.37$, $\rho < 0.001$) is substantially lower. Further, consistent with the researcher expectations, user satisfaction has a very strong positive effect on information technology usage ($\beta = 0.39$, $\rho < 0.001$).

In summary, the tests of the structural model show that user satisfaction is an important factor affecting information technology usage and has the strongest direct effect on user performance. Information technology usage also affects user performance, though its effect on user performance is much smaller. The results also demonstrate the importance of information technology usage in mediating the relationship of user satisfaction on user performance.

7. Discussion

User satisfaction is the most important factor. User satisfaction can affect both direct and indirect to hotel performance. An employee is satisfied with using computer indirect affect hotel performance, namely through user performance. In another word, user satisfaction and information technology usage affect user performance and that IT usage partially mediates the effect of satisfaction on user performance.

User satisfaction and user performance, furthermore, affects hotel performance and that user performance partially mediates the affect of satisfaction on hotel performance.

The results also indicate that user satisfaction has a significant affect on user performance. The analysis provides strong support for the model. In particular, the results demonstrate the importance of examining user satisfaction in explaining user performance.

The results also show that user performances are a function of both information technology usage and user satisfaction, which in turn show how information technology adds value to user performance. It should be noted that user satisfaction, an intrinsic variable has a stronger affect on user performance than information technology usage, an extrinsic variable. The effect of user satisfaction on user performance is partially mediated information technology usage.

The results may suggest that information technology usage and user satisfaction are indicators of a user performance. These results are consistent with prior research, which suggest that computer system acceptance (e.g., satisfaction and usage) may produce performance value and operational effectiveness. The other research founded that IT acceptance helped individuals to accomplish their tasks more effectively and increased their productivity.

In this research, the results also show that the presentation of information (an useful format), sufficient information, provide precise information, design of report content of information are the importance factors.

The significant link among information technology investment, information technology usage, user satisfaction, user performance, and hotel performance has some implications for practitioners. The financial importance is obvious, when making investment decisions prior to purchasing Information Technology, management should consider the impact of the proposed system on user performance (i.e. productivity, their effectiveness, job performance, and decision making quality) and eventually on hotel profitability.

Finally, the results also show that user performance is also affected by user satisfaction. Thus, users who are satisfied by using IT or the system were more likely to report a greater level of use and eventually, a greater level of user performance. In practice, hotels can indeed add value from adoption of Information Technology. However, in its adoption, the results seem to demonstrate the need for careful planning in creating and establishing a higher level of user satisfaction.

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