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 khusus bagi para eksekutif senior yang harus memutuskan, apakah akan melanjutkan investasi dibidang 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. Penelitian ini mempertimbangkan pertanyaan ini dalam ruang lingkup industri perhotelan, yang sangat tergantung pada penggunaan teknologi informasi dalam kegiatan operasionalnya sehari-hari. Lebih khusus, penelitian ini menginvestigasi hubungan diantara (a) investasi teknologi informasi, (b) penggunaan teknologi informasi, (c) kepuasan pengguna komputer, (d) kinerja pengguna komputer dan (e) kinerja hotel.

Sebuah survei 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, dan Hospitality Industry

INTRODUCTION

The impact of information technology (IT) investment in organizations has received considerable attention in the literature during the past few years (Kauffman & Weill, 1989; Harris & Katz, 1991; Weill, 1992a; 1992b; Wilcox, 1994; Raymond et al., 1995; Byrd & Marshall, 1997; Sriram et al., 1997; Sohal & Ng, 1998; Lyytinen & Rose, 2003; Sabyasachi, 2005; and Bhatt & Grover, 2005). On the one hand, IT is seen as the enabling agent through which organisations can improve their operational efficiency and strategic position in an increasing competitive business environment. On the other hand, in the current economic climate, many are questioning the real benefits of the ever increasing IT investment in the organization.

Past research on the impact of IT investment on organisational performance has been rather inconclusive. Research literatures do not give reliable generalization about the relationships between IT investment and organisational changes (Powell & Dent-Micallef, 1997; Fitzgerald, 1998; Sabyasachi, 2005). Some studies found a positive relationship between the two, while other actually found no relationship at all. It is generally believe that there are other factors, which come into play.

Unfortunately, too often the decision to invest was made based on fear of being left behind by competitors rather than on a genuine understanding of the real benefits that IT can bring to the organisation (Weill, 1992a). This lack of understanding can lead to the organization's inability to generate a shared vision among employees on how to leverage the real potential of IT in that organisation. Consequently the huge investment in IT orientated by the organisation sometime did not produce the full benefits that was expected at the time when the decision to invest was made. The purpose of this research is to examine the different employee perceptions and expectations of the impacts of IT investment on the organisation, and to develop an instrument to measure these perceptions. It is hoped that the findings will assist senior management (top management) to have a more realistic approach in making decisions on organisational investments in IT and the associated expectation of the likely benefits. The findings will also provide some insights to senior management as to how to harness the human elements of the organisational information system to ensure that the technological capabilities of the system are fully utilized.

In this research, the hotel industry was chosen as the subject of investigation. There are several reasons for this choice. Firstly to the best knowledge of the authors, this industry has not been the central subject of study in this research area. Secondly, during the last few years hotels have become increasingly dependent on computer and communications technology to manage the diverse range of service provision, needed in a highly competitive and globalised market.

Instead of conducting the study in a technologically developed country, the authors have chosen to study the organisational impact on hotels at a regional location, viz. Bali, Indonesia, which is considered as a part of the developing region of the world with rapidly changing national information infrastructure. But in terms of tourist demand, Bali is no less significant than any other international destinations. Hence the need of technology support to maintain a highly competitive customer service is just as real as in other parts of the world. This challenge is clearly recognized by the local tourism authority (Mardani, 1997).

The remainder of this paper is organized into several sections. The next (second) section begins with a brief review of previous research in this area. The third section provides a brief description of the research methodology employed in this research. Descriptive data analysis, and the reliability and validity of the instrument are reported in the fourth section. The paper concludes with a discussion on the implications of these findings for management.

Previous Research

Given the high level of financial stakes involved, the investigation on the impact of information technology investments on organisational performance and organisational processes has been and continues to be a major research concern for practitioners and academics (Willcocks, 1996). Previous studies have evolved from early anecdotal reports to more recent empirically-based research (e.g. Sriram et al., 1997). They also covered a wide range of perspectives including investigation on research methodologies (Orlikowski & Baroudi, 1991), the extent of IT use (Weill, 1992b), the concept of organisational performance and business value (Mukhopadhyay et al., 1995), the strategic advantage of the firm (Weill, 19992a, Mata et al., 1995), the impact on inter-organisational relationships, the impact on

the management function and its structure, the change in organisation's work environment, and even the very nature of the organisation's core business in the marketplace (Willcocks, 1994 and Zmud, 2003).

The relationship between IT and the organisation is multi-facet and highly complex. The impact of IT investment in organizations is far reaching, and may affect not only the internal attributes but also the external attributes of a firm. Attempts to isolate a particular aspect of the relationship often lead to different or even seemingly contradictory results. For example, a careful review of research studies on the impact of organisational IT investment on organisational performance is likely to result in an inconclusive view of the relationship, as studies reported both positive and negative impacts, as well as no relationship at all.

To highlight the diverse perspectives on this relationship, three tables are presented which provide a summary on the findings of major studies by different researchers on this issue. Table 1 summarizes those studies, which yielded a positive relationship.

Table 1: Studies showing positive relationship between IT investment and organisational performance

References	Industry	Key variables and key findings
Bender (1986)	Insurance	Optimum level of performance achieved at a range of IT investment from 15% to 25% of total operating cost of the firm.
Banker, Kauffman & Morey (1990)	Fast Food stores	Stores with the technology and large breakfast sales (more complex breakfast menu) performed significantly better in terms of cutting materials handling costs.
Harris & Kats (1991)	Insurance	Firms with the most improvement in organisational performance allocated a significantly higher proportion of their non-interest operating expenses to IT.
Weill (1992b)	Valves manufacturing	Transactional IT investment correlated positively with organisational performance
Santos, Peffers & Mauer (1993)	Finance and manufacturing	Market value of the firm reacted positively to the announcements of IT investment by the organisations.
Mahmood (1994)	81 firms from Computerworld in a non-random sample	Firms in the efficient group had a much higher return on their IT investment than the inefficient group.
Raymond, Pare & Bergeron (1995)	Manufacturing	IT usage is positively related to organisational performance and the relationship between IT management and structural sophistication is stronger among the better performing firms.
Lubbe, Parker & Hoard (1995)	Insurance	Positive relationship found between the computerization index and the financial ratios; the most profitable firms were more likely to spend a higher proportion of the non-interest operating expenses on IT.
Sriram, Stump & Banerhee (1997)	Purchasing	Positive relationship was found: IT used in purchasing is not a homogenous phenomenon, but can be represented by three components- basic computer systems & support, purchasing-specific applications, and vender communications.
Rai, Patnayakuni & Panayakuni (1997)	Purchasing	IT investment made a positive contribution to the firm's output and labor productivity.

Table 2 summarizes those studies which gave a negative relationship. Finally, Table 3 lists those studies where the authors found no relationship exists between IT and organisational performance. For other recent reviews on the subject, readers are referred to the articles by Powell & Dent-Micalleff (1997), Mahmood (1997), and Sohal & Ng (1998).

Table 2: Studies showing negative relationship between IT investment and organisational performance

References	Industry	Key variables and key findings
Cron & Sobol (1983)	Warehousing	Firms that make extensive use of computer have either a very strong or a very week financial performance.
Roach (1988)	Finance	IT investment had negative and dysfunctional effects on organizational performance.
Kauffman & Weill (1989)	Valves manufacturing	Very little evidence of the value contributed by IT investments.
Weill (1992b)	Valves manufacturing	Strategic IT investment had a negative relationship to organizational performance
Hitt and Brynjolfsson (1996)	Finance	Small negative relationship between computer capital and total shareholder return in at least one year.

Table 3: Studies showing no relationship between IT investment and organisational performance

References	Industry	Key variables and key findings
Turner (1985)	Banking	No relationship was found between organisational performance and the relative proportion of resources allocated to data processing.
Strassmann (1985)	Service sector firms	No significant relationship was found between high performing firms and the size of IT investment.
Santos ; Peffers & Mauer (1993)	Finance and manufacturing	No excess return was found for either the full sample or for any one of the industry sub samples.
Powell and Dent-Micallef (1997)	Retail industry	IT alone had not produced sustainable performance advantages.

Recognizing the complexity of the issues under consideration, some authors attempted to investigate the intervening factors in the IT investment organisational performance relationship. Floyd and Wooldridge (1990) examined the evidence of IT investment having a moderating effect on the organisational competitive strategy and financial performance. On the other hand, Parthasarthy and Sethi (1993) investigated how strategy and structure moderate the relationship between capital outlay in

computer automation and firm performance. In their study, they found that the flexibility of business and manufacturing strategies, quality of leadership, and cost leadership had a significant moderating effect. More recently, Sohal and Ng (1998), in their study of 530 companies in the Australian manufacturing, banking and finance, and insurance industries, found that the greatest impediments in unleashing the full potential of IT in an organisation are the misalignment of business and IT strategies, lack of change in historic IT structure, lack of a full understanding of the potential of IT, and lack of senior management support.

In the context of these findings, the present study attempts to go beyond simple financial measures of organisational performance and consider a number of user organisation variables as perceived by the employees which may be affected by the organisational investment in IT. Therefore, as well as examining the employees' (in their roles as the user of the IT systems) perceptions on the organisation performance, this study also probe their perception on (a) user satisfaction with the organisational information system, (b) the level of IT usage and (c) the effect of IT on employee performance. The basic premise is that, the employees' perception of the benefit of IT investment plays an important role in determining whether the investment itself will lead to actual improvements in organisational performance.

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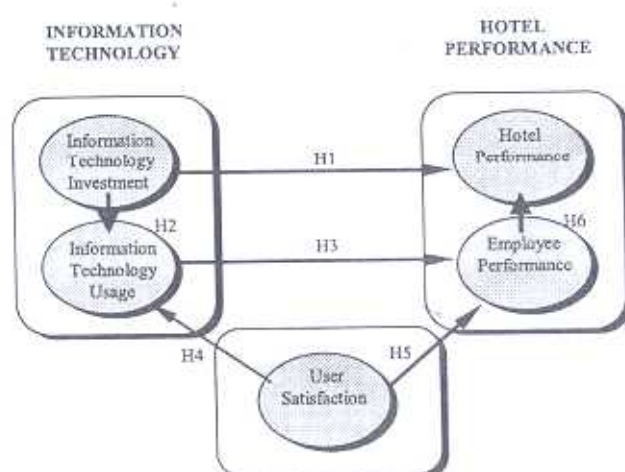
The first hypothesis addresses the main aim and objective of this research. The remaining hypotheses explore the inter-relationship in more detail to show the manner in which information technology investment by the hotel may impact upon the hotel performance. As the objective is to discover relationships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

Methodology

This study follows the survey research methodology. Based on previous research in related areas, a questionnaire was constructed to measure the perceptions of the employees on each of the following five variables:

- the level of information technology investment (ITI) by the organisation,
- the amount of information technology usage (ITU) in the organisation,
- the level of user satisfaction (US) with the organisational information system,
- the level of employee performance (EP), and
- the level of organisational (in this case the hotel) performance (HP).

After pilot testing, the questionnaire was administered to a group of subjects consisting of the employees in twenty 4- 5-star hotels in Bali, Indonesia. The data were analyzed using SEM (Structural Equation Modeling). The remainder of this section gives a brief description of the sample, the survey instrument and the survey procedure.

Sample

The target group chosen for this research were hotel employees in Bali, Indonesia, who regularly used computers in the performance of their duties. They include those working at both the front counters and at the back offices as well as people in management positions. In addition to standard hotel reservation and accounting, these employees used a variety of computerized applications in their daily work. It is thought that the different employment situations will provide a wider and more representative viewpoint in the survey.

Only hotels with 5- and 4-star rating were chosen rather than the lower ranking hotels, because typically hotels in the former group are better equipped with IT facilities and they tend to cater for international tourists. A larger proportion of employees in these hotels were supplied with PCs. All PCs and minicomputers in the hotels surveyed in this study were connected to the corporate computer network.

Survey Instrument

A four-page questionnaire consisting of six subscales was developed. In the first subscale, demographic information such as age, gender, marital status, position in hotel, educational background, and individual income level were sought. In the remaining five subscales, questions were adapted from similar instruments reported in the literature by previous researchers, to measure the perception of the subjects on the five variables under consideration, viz. information technology investment by the organisation (ITI), information technology usage by employees (ITU), user satisfaction with the IT facilities (US), level of employee performance (EP) and level of hotel performance (HP). The structure of the questionnaire is summarized in Table 4. The main references on which the subscales are based or adapted are also indicated in the table.

Each question in the last five subscales of the questionnaire was scored on an 11-point Likert Scale ranging from (0) "not at all/almost never" to (10) "extremely large/almost always". The two "frequency" questions in the ITU subscale, naturally involve counting of the number of applications and is not based on the Likert rating scale, but the semantic differential scale.

Table 4: Structure of the Questionnaire

Subscale	What it measures	Key elements of the questions	Source references
1 DEMO	Demographics	Age Gender Marital status Position in Hotel Educational background Income level	
2 ITI	Information technology investment	Hardware investment Software investment Training costs Support costs Total investment	Sriram, Stump & Banerhee (1997)
3 HP	Hotel performance	Hotel financial performance Hotel room occupancy Number of visitors	Jeffrey & Hubbard (1994)
4 ITU	Information technology usage	Frequency of use Time of use Criticality of use Feeling of IT usage Number of business task used Number of computerized applications	Straub, Limayem & Karahanna-Evaristo (1995); Igbaria & Tan (1997)
5 US	User satisfaction	Provide precise information Information content meet needs Provide reports needed Sufficient information Computer system accuracy Satisfied with accuracy Output in useful format Information clear User friendly Ease of use Information on time Up to date information	Doll & Torkzadeh (1988)
6 EP	Employee performance	Productivity Job performance Effectiveness of the job Decision making quality	Igbaria & Tan (1997)

Information Technology Investment

To measure information technology investment, it is not sufficient to consider the total cost of IT equipment. Sriram et al. (1997) pointed out that, in addition to hardware, software and telecommunications costs, there are other costs associated with the support and operation of IT facilities in an organisation. This study identified four components: computer hardware cost; computer software cost; the cost of training IT users; and the cost of supporting IT users during normal operation. Telecommunication costs,

and the cost of system design have been absorbed into the other components. The authors believe that by measuring each of these separately, the study provides a more complete and reliable picture on the organisational IT investment.

Information Technology Usage

Several researchers (Straub et al., 1995; Igbaria & Tan, 1997; and Venkatesh et al., 2003) have reported instruments with reliability 0.7 or higher to measure information technology usage. From their works, six measures were chosen 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 the survey questions. The number of business tasks involving the computer and the number of different computer applications used were employed as an indication of the extent of IT usage.

User Satisfaction

Delone and McLean (1992) argued that user satisfaction occupies a key role in information system success. In the present study, user satisfaction is taken to mean the employees' attitude towards the use of computer facilities as they perform their daily duties in the hotel. The scale, developed by Doll and Torkzadeh (1988) with $= 0.8$, was adapted here to measure the overall user satisfaction that includes a measure of the extent to which organisational information systems meet the end-user's needs with regards to information content, accuracy, timeliness, format and ease of use.

Employee Performance

Employee performance was measured based on a scale developed by Igbaria and Tan (1997) (" $= 0.8$). What is being measured here is the employees' perception of their own performance improvement (or the lack of it) in four indicators as a result of the use of IT facilities. The four indicators are (i) productivity on the job, (ii) job performance, (iii) effectiveness on the job, and (iv) decision-making quality.

Hotel Performance

Organisational performance is a complex phenomenon. Any finite set of measures for hotel performance is likely to be too simplistic. Financial indicators alone are not sufficient to capture the broad scope of hotel performance. Therefore three different global measures were chosen in this study: (i) hotel financial performance; (ii) room occupancy rate; and (iii) the number of visitors. This set of measures provides a performance profile in terms of occupancy and visitation rate as well as financial performance. It was found to be a better indicator of the overall performance of hotels (Jeffrey and Hubbard, 1994).

Survey Procedures/Data Collection Method

The instrument was first pilot tested on a small group of hotel employees selected. Preliminary analysis of the pilot data showed that those completed the survey form were generally happy with the questions asked. Minor changes were made to the item statements to improve clarity of presentation.

Prior to the conduct of the full survey in 2004, the approval and support of the Director of the Department of Tourism and Culture at Bali was obtained. As a result, the researchers were able to claim official sanction and legitimacy of the research project, thus improving the response rate. To assist with the data collection process, the Department also provided useful information on the addresses of the twenty-eight 4- and 5-star hotels in Bali, their phone and facsimile numbers, the names of the hotel general manager, the number of employees, and the number of rooms in each hotel.

With a letter of introductory from the Bali Tourism Director, initial telephone contacts were made with the General Manager of all 28 hotels in Bali, and permission was sought to conduct a survey in their hotels. Out of the 28 hotels, twenty were willing to participate in the research representing 71 percent of the population group (in hotel counts). It is believed that this should provide an adequate sample of the target population. These 20 hotels employ a total of 11,529 employees. Of these, 1, 131 or approximately 10 percent used computers directly in their daily duties.

Questionnaire forms were then hand-delivered to these 20 hotels for distribution to the 1,131 employees. The survey package consists of a 4-pages questionnaire, a covering letter, a guide on how to fill the questionnaire, and the letter of introduction from the Director of the Bali Department of Tourism and Culture. Hotel General Managers who had agreed to participate were urged strongly to encourage their employees to complete the questionnaire. As an incentive, a souvenir key ring from Australia was offered as a token of appreciation to all those employees who have returned a completed questionnaire, a gesture that proved to be very popular.

To ensure a degree of objectivity in the survey data, selected employees were personally interviewed by the researchers to verify the accuracy of the self-reported data. As far as the researchers were able to ascertain, the self reported data were found to be reliable.

Data Analysis

The data collected from the survey were scored and entered in the computer for analysis. Some preliminary results relating to the sample characteristics, the reliability of the questionnaire, and the validity of the measures are reported in this section.

Respondent Characteristics

Of the 1,131 questionnaire forms distributed, 945 completed forms were returned, representing a response rate of 83 percent, which is considered an acceptable level of response in this type of research. Listed in Table 5 are the ID of the hotels that participated (names were suppressed for confidentiality), the number of employees in each, the number of completed questionnaires returned, and the number of persons interviewed for validation purpose.

Table 5: Questionnaire Response Rates

Hotel ID	Star Level	Total employees	IT end-user employees	Questionnaire returned	Percentage of returns	Persons interviewed
1	5	985	90	80	88.9%	5
2	5	804	78	61	78.2%	4
3	5	784	80	60	75.0%	4
4	5	773	70	55	78.6%	4
5	5	759	76	60	78.9%	4
6	5	751	75	71	94.7%	4
7	5	717	100	78	78.0%	5
8	5	708	55	35	63.6%	3
9	5	693	60	56	93.3%	3
10	5	670	70	62	88.6%	4
11	5	628	40	36	90.0%	2
12	5	592	55	50	90.9%	3
13	5	580	60	55	91.7%	3
14	5	418	40	32	90.0%	2
15	5	386	40	35	87.5%	2
16	4	309	30	28	93.3%	2
17	4	292	30	25	83.3%	2
18	4	234	30	24	80.0%	2
19	4	227	27	22	81.5%	1
20	4	220	25	20	80.0%	1
Total/Average		11,529	1,131	945	83.6%	57

An examination of the individual response rate for each hotel, all except Hotel No. 8, have a response rate of 75 percent or above. Even in the lowest case, the response rate is 63.6 percent. Therefore, the data collected may be considered a reasonable representation of all the IT end-user employees in these hotels. The biographical characteristics of the respondents in this survey are summarized in Figures 1 and Table 6.

With respect to age (Figure 2), the majority of the employees surveyed were relatively young (70.6 percent of the respondents fell in the age range of 25-40). The mean age of the respondents was 34. It is generally believed that younger workers are likely to be more receptive to the introduction of new information technology into their workplace environment. As shown in Table 6, the majority of the respondents, 64 percent were male and only 36 percent were female. This gender distribution reflects the typical trend of the workforce in Indonesia.
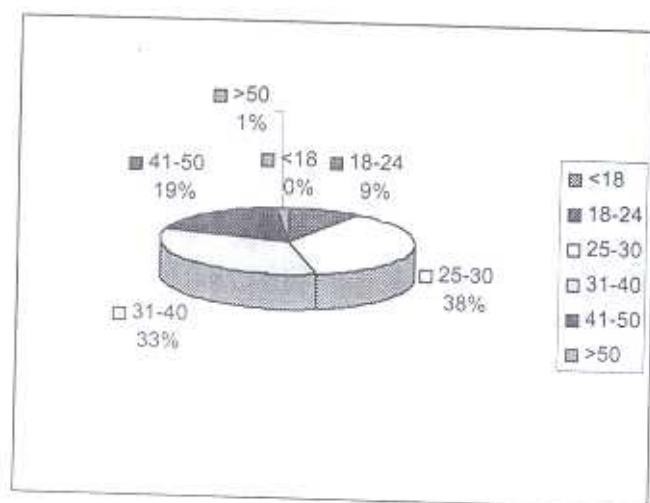
Figure 2: Age Distribution

Table 6: Background Information of the Respondents

No	Gender	Frequency %	Position in Hotel	Frequency %	Educational Level	Frequency %
1	Male	608 (64.3%)	Accounting/Finance	256 (27.1%)	High School	281 (29.7%)
2	Female	337 (35.7%)	Receptionist/Front Office	165 (17.5%)	Diploma	398 (42.1%)
3			Human Resources/Staffing	111 (11.7%)	Bachelor	213 (22.5%)
4			Information System	109 (11.5%)	Master	32 (3.4%)
5			Marketing	111 (11.7%)	Doctorate	0 (0%)
6			Others	193 (20.4%)	Others	21 (2.2%)
	Total	945 (100%)	Total	945 (100%)	Total	945 (100%)

No	Monthly Income (Rp)	Frequency %	Marital Status	Frequency %
1	< Rp 1,500,000	53 (5.6%)	Single	258 (27.3%)
2	1,500,001 – 2,500,000	507 (53.7%)	Married	679 (71.9%)
3	2,500,001 – 3,500,000	153 (16.2%)	Divorced	8 (0.8%)
4	3,500,001 – 4,500,000	111 (11.7%)	Widowed	0
5	> Rp 4,500,000	121 (12.8%)	Others	0
	Total	945 (100%)	Total	945 (100%)

As for the nature of their employment positions, the largest group of respondents (27.1 %, See Table 6) were working in the accounting and finance sections of the hotel, signifying that this job function is probably the most computerized group in the hotel. The second largest group of subjects worked in the front office. It is 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. This seems to indicate that the application of information technology is reasonably wide spread among these hotels.

Table 6 also shows the educational levels of the subjects. Over two-thirds of the hotel employees participated in this survey (68%) have at least either a tertiary diploma or university degree. About 30% have only completed high school education. The trend of the hospitality industry in employing more professionally trained workers was evident here.

In terms of the monthly income level, the largest group (53.7%) fell in the range Rp. 1.500,001 to Rp. 2,500,000, while a further 40.7% was remunerated at a higher level. According to Statistics Office of Bali Province, the modal monthly income in Bali for all employment is in the range Rp. 750,000 to Rp. 1,000,000. This means that the people employed in the hospitality industry enjoyed a much higher level of pay compare to all employment groups.

Reliability of the Scale

Table 7 gives the descriptive statistics: means, standard deviation and factor loading (to be discussed later) for each item in the questionnaire. It is noted that all items were found to have a mean value ranging from 7.47 to 8.50 in the 11-point scale where a value of 5 is regarded as the neutral point. This indicates that the ratings from the respondents tend to lie on the positive side of the rating scale. Furthermore the standard deviations were found to range from 0.88 to 1.35, indicating a relatively high degree of consensus among the respondents in their perception of the rating of the five variables in question.

Factor analysis was carried out on each of the five research variables with respect to items in the questionnaire. In each case only one factor was identified, accounting for 74 percent to 84 percent of the variance in the set of questionnaire items. The Factor loading for each item is shown in Table 7. The homogeneity of the factor loading coefficients is to be expected as most items are adapted from other similar instruments.

To assess the reliability of the instrument, the Cronbach (1981) alpha coefficients for the total questionnaire and the five subscales were calculated and reported in Table 8. The Cronbach alpha is the most widely used index for determining internal consistency (Kerlinger, 1986). It has been generally accepted that in the early stages of research on hypothesized measures of a construct, reliabilities of 0.70 or higher are needed, while for widely used scales, the reliabilities should not be below 0.80 (Nunnally, 1978). In the current survey, all subscale alpha coefficients exceed 0.90 with an overall alpha value of 0.94 for the entire questionnaire. The high alpha value in all five subscales confirms the homogeneity of the items comprising them, and indicates an acceptable level of reliability.

Table 7: Descriptive Statistics for the five variables (ITI, ITU, US, EP and HP)

Code	Variables	Factor Loading	Mean (Scale 0- 10)	Standard Deviation
ITI-1	Computer hardware costs	0.911	7.85	1.25
ITI-2	Computer software costs	0.916	7.83	1.25
ITI-3	Cost of training Information Technology Users	0.857	7.47	1.35
ITI-4	Cost of supporting Information Technology Users	0.883	7.73	1.29
ITI-5	Total cost of IT investment	0.918	7.81	1.20
HP-1	Hotel financial performance rating	0.882	8.31	1.11
HP-2	Room occupancy rates	0.952	8.30	1.08
HP-3	Number of visitors	0.953	8.30	1.08
ITU-1	Frequency of IT usage	0.897	7.89	0.92
ITU-2	Time of IT usage	0.891	7.89	0.88
ITU-3	Importance of IT usage in daily tasks	0.906	7.86	0.91
ITU-4	Attitude towards IT usage	0.919	7.84	0.90
ITU-5	Number of business tasks using IT	0.802	7.90	0.89
ITU-6	Number of computerized applications	0.789	7.87	0.92
US-1	Provide precise information	0.890	8.05	1.00
US-2	Information content meets the needs	0.875	8.05	1.02
US-3	Provide reports what users need	0.858	8.05	1.04
US-4	Provide sufficient information	0.895	8.02	1.04
US-5	Computer system accuracy	0.872	8.06	1.06
US-6	Accuracy Satisfaction	0.876	8.06	1.03
US-7	The output in an useful format	0.891	8.08	0.99
US-8	Clarity of information	0.897	8.08	0.99
US-9	System user friendly	0.842	8.02	1.02
US-10	Ease of use	0.837	8.05	0.99
US-11	Information available on time	0.862	8.07	1.03
US-12	Up to date information	0.829	8.03	1.05
EP-1	Productivity increases on the job	0.912	8.41	1.02
EP-2	Job performance improvement	0.945	8.40	1.01
EP-3	Effectiveness enhancement on the job	0.928	8.50	0.99
EP-4	Decision- making quality increases	0.891	8.40	1.01

Table 8: Cronbach's Alpha Coefficient of Reliability

Name of Subscale	Variable Code	Reliability (Cronbach's Alpha)
Information Technology Investment (ITI)	ITI 1 - IT15 (5items)	0.938
Hotel Performance (HP)	HP 1 - HP3 (3 items)	0.920
Information Technology Usage (ITU)	ITU 1 - ITU6 (6 items)	0.934
User Satisfaction (US)	US 1 - US 12 (12 items)	0.970
Employee Performance (EP)	EPI - EP4 (4 items)	0.938
ENTIRE QUESTIONNAIRE	All 30 items	0.939

Validation of the Perception Measures

In using perception rating to assess user-organisation variables, a reasonable question to ask is whether the employee's perception is an accurate measure of the reality? For example, how much one can rely on the employee's perception to measure the organisation's actual investment on IT? or to measure the organisation's actual performance?

To answer these questions, permissions were obtained to access the actual annual records of selected hotels to extract the objective measures of IT investment and hotel performance. In all, six hotel general managers gave their permission to the researchers to search their company records. Actual figures of the hotels' investment in IT in the previous year were obtained, including hardware costs, software costs, IT training costs, user support costs, and total IT investment. Also, actual figures of the hotels' performance in the previous years were obtained, including the net financial return, hotel occupancy rate and the number of visitors to the hotel.

These actual values were compared with the subjects perception data obtained from the questionnaire by regressing the actual measures on the perception measures. Table 9 gives the results of regression analyses. The "R square" values are all greater than 0.77, indicating that at least 77 percent of the variance in the actual measures can be accounted for the perception data. In fact, most of the items are above 90 percent showing a strong relationship between the two. This means, according to the actual data from the hotel records, the perception ratings by the employees could be considered to be reliable indicators for the variables under consideration.

Table 9: Regression of Actual Data on Employees' Perception

Var	Question items	R Square	df	F	Sig.	b0 Constant	b1
ITI	Computer Hardware Costs (ITI- 1)	0.927	4	50.76	0.002	6.816	2.4E-09
	Computer Software Costs (ITI-2)	0.926	4	49.98	0.002	7.2189	3.9E-09
	Costs of Training IT Users (ITI-3)	0.962	4	102.60	0.001	6.293	1.5E-07
	Costs of Supporting IT Users (ITI-4)	0.771	4	13.47	0.021	6.847	3.2E-08
	Total Costs of IT Investment (ITI-5)	0.811	4	17.20	0.014	7.727	4.7E- 10
HP	Financial Performance (ROI) (HP-1)	0.897	4	34.66	0.004	7.2996	0.0174
	Occupancy Rates (HP-2)	0.972	4	136.60	0.000	5.970	0.0301
	Number of Visitors (HP-3)	0.933	4	55.68	0.002	7.079	1.9E-05

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 research.

Structural Equation Model (SEM)

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 (Bacon et al., 1997; Hair et al., 2004).

Figure 3 shows the 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 Software to assess construct validity of the five latent variables. Indicated in the path 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 l 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 l 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 research
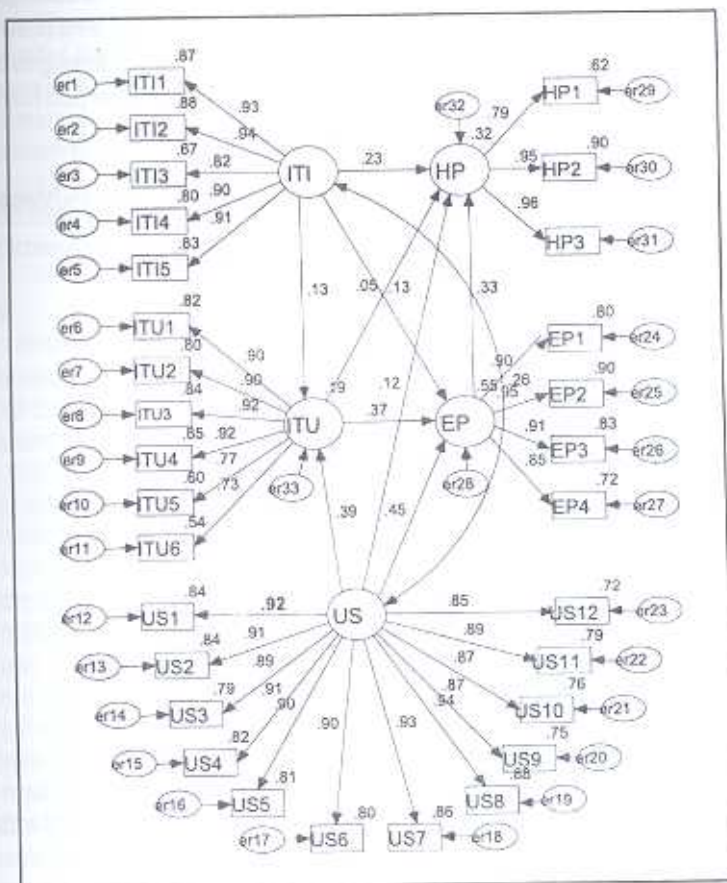
To assess the model, multiple fit indicators are examined. As the traditional χ^2 test has been recognized as an inappropriate test for large sample sizes (Browne and Cudeck: 1993, Marsh: 1994), three other indices are also included: the AGFI (Adjusted Goodness of Fit Index) (Joreskog and Sorbom, 1993), 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.

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

this research? 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.

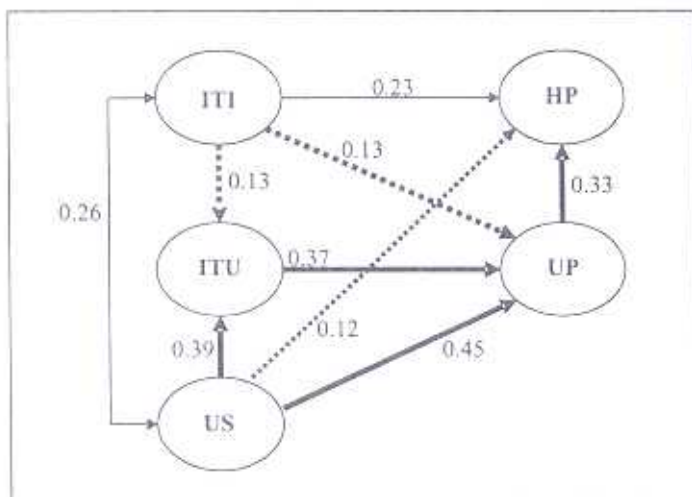**Figure 4: Relationship model showing the impact of IT Investment on Hotel Performance**

Figure 3 achieved a good fit of fit of the data. The fitted structural equation model with standardized regression coefficient (with t-values in the parenthesis) are:

HP $=$ 0.226 ITI $+$ 0.331 UP $+$ 0.121 US $+$ error (68%)
(t = 6.808)   (t = 7.049)   (t = 3.042)

UP $=$ 0.373 ITU $+$ 0.447 US $+$ 0.133 ITI $+$ error (45%)
(t = 12.691)   (t = 14.836)   (t = 5.030)

ITU $=$ 0.130 ITI $+$ 0.389 US $+$ error (81%)
(t = 3.909)   (t = 11.527)

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 4, 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 (b = 0.45, r < 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 (b = 0.37, r < 0.001) is substantially lower. Further, consistent with the researcher expectations, user satisfaction has a very strong positive effect on information technology usage (b = 0.39, r < 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.

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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