

**“ICT ADOPTION PROPENSITY IN THE HOTEL INDUSTRY:
AN EMPIRICAL STUDY”**

By

Pongsak Hoontrakul^π

Sasin of Chulalongkorn University, Bangkok, Thailand
and

Sunil Sahadev

Indian Institute of Management, Kozhikode, India &
Sasin of Chulalongkorn University, Bangkok, Thailand

First Draft : June 2004

Current Draft : December 15, 2005

ABSTRACT

The information and communication technologies are revolutionizing the hospitality sector over the years. This study looks at the propensity for adoption of ICT based facilities in the hotel industry. There is a large variation in the propensity of adoption of ICTs among the hotels in the industry. In this study the factors that influence a hotel’s propensity to adopt ICTs is analyzed. The factors are broadly divided into the location related factors and the firm related factors. The study also proposes a methodology to measure the propensity of adoption of technologies by the hotels. The analysis of the relative impact of the factors is carried out through a survey amongst 95 hotels from seven locations in the Thailand. The study concludes by arguing for greater impetus to promote ICT adoption among hotels due to its impact on reducing the level of ‘tourism leakage’.

Key words: propensity to adopt, Information and Communication Technologies, Hotel industry, Thailand.

^π All correspondence is at Pongsak Hoontrakul, Senior Research Fellow, Sasin-GIBA, Chulalongkorn University, Sasa Patasala Building, 8th floor, Soi Chulalongkorn 12 (2), Phyathai Road, Bangkok 10330, Thailand. Private Tel. (662) 954 1689 ; Fax (662) 954 1690 ; Email : pongsak@hoontrakul.com

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INTRODUCTION

The rapid development and commercialization of Information and Communication Technologies (ICTs) for the travel and tourism industry has prompted hotels and other enterprises in this sector to increasingly adopt these technologies. This is based on the expectation that the new ICT based technologies and processes would lead to an improvement in their operating efficiencies and customer service levels. According to Connolly and Olson (2000), Information and Communications Technology is the single greatest force affecting change in the hospitality industry. Buhalis (1998) attributes this trend to both the rapid advances in technology as well as the increasing demands of the customers who look forward to flexible, specialized, accessible and interactive products and communication with principals. The ICT based products and processes help the hotels to enhance the operating efficiency, improve the service experience as well as provide a means to access markets on a global basis. While ICTs were used in the hotel industry from the late seventies in the form of Computerized Reservation systems and Global

^π All correspondence is at Pongsak Hoontrakul, Senior Research Fellow, Sasin-GIBA, Chulalongkorn University, Sasa Patasala Building, 8th floor, Soi Chulalongkorn 12 (2), Phyathai Road, Bangkok 10330, Thailand. Private Tel. (662) 954 1689 ; Fax (662) 954 1690 ; Email : pongsak@hoontrakul.com

distribution systems, it was only in the 90s that the ICTs began to make a difference in the hospitality sector (Cooper et al, 1998). However, as in the case of other sectors, the rate of adoption of ICTs has been found to be quite uneven across the hotels.

The variations in the rate of adoption of new technologies have been studied from different perspectives over the years. A large number of studies [eg. Rogers (1995), Tornatzky and Fleischer (1990)] have focused on the intention to adopt variable to indicate the difference in adoption levels. This variable effectively describes a firm's intention to adopt or not adopt a new technology. This construct however does not necessarily look at the enterprise's propensity to adopt. The propensity to adopt is reflected in the time taken by an enterprise before adopting a technology. The propensity of adoption has also received sufficient research attention over the years [eg. Rose and Joskov (1990), Nambisan and Wang (2000)]. The present study attempts to analyze the factors that influence the propensity to adopt ICTs in the hotel industry.

Factors Determining the Adoption Propensity for ICTs

The firm's propensity to adopt is a manifestation of its inclination towards innovativeness, and also reflects its ability to evaluate, accept and use new technologies. A firm with a high level of adoption propensity will be an early adopter of the new technology and will thus be a risk taker. The adoption propensity of a firm is fuelled by its attitude and belief in innovativeness as a source of competitive advantage. This belief is in turn based on the factors that define the competitive environment of the enterprise. Further, an enterprise's adoption propensity is also

based on factors related to its internal capabilities and requirements. Thus a firm's propensity to adopt a new technology is affected by several factors, both internal and external.

Past studies in this area have focused on several factors that affected the adoption propensity for new technologies. For instance, the effect of firm size on adoption propensity in different sectors was studied by Oster (1982), Hannan and MacDowell (1984) and Rose and Joskov(1990). Levin et al (1987), and Hannan and MacDowell (1984) studied the effect of market concentration on the adoption propensity of firms. Nambisan and Wang (2000) studied the effect of Knowledge barriers that exist within organizations to the adoption propensity of an organization.

In the hotel industry, the geographic location of a hotel has a major impact on its operations and profitability. The geographical location of a hotel would greatly determine the profile of its visitors, the size of its market and the level of competition that it has to face. These three variables have a strong impact on the ICT adoption propensity of a hotel also. This is because the ICT adoption propensity of a hotel can be linked mainly to its expectations about the value addition that the ICTs can provide to its customers, as well as the belief about the expansion of its target market through ICTs. A hotel will therefore be more inclined to adopt ICTs if it expects the ICT based facilities to either provide greater competitive advantage or to blunt the advantage enjoyed by its competitors considering the characteristics of its customer profile, its market size and the intensity of competition that it has to face. Thus based on the profile of a hotel's visitors, the size of the market, or the intensity of competition, hotels may differ in their levels of ICT adoption propensity. Wei et al (2001) found significant impact of geographical location on the adoption and use of the Internet among hotels.

Thus the location related factors considered in this study are: (i) the percentage of consumers who visit the hotel's location from high Internet penetration countries, (ii) the overall market size of the hotel's location, and (iii) the level of competition between the firms in the locality.

Unless the target consumers access and use the Internet as a medium for transaction, the hotels are not in a position to rely heavily on the Internet for its marketing activities. Therefore hotels in those locations where most of the visitors come from a country with a high level of Internet penetration would find the Internet to be of greater use than hotels in those locations where the major part of the visitors are from countries where the Internet penetration is low. This will in fact prompt hotels in locations with a high proportion of visitors from high Internet penetration countries to adopt the Internet based technologies that enables them to enhance their market reach in a much faster manner. The market size, in terms of the number of tourists who visit the location, will also be a significant factor that affects ICT adoption propensity, since hotels in smaller underdeveloped destinations may need to use the internet and other ICT based technologies like the GDS to a greater degree to reach out to the global population than hotels located in developed destinations.

The competition level among the hotels in a location, can also influence the adoption propensity of a hotel. The general occupancy rate in the location is an indicator of the competitive intensity among the hotels in a location. High levels of occupancy rate at a location imply that the competition is low, and the hotels can expect to get their rooms filled with relative ease while low levels of occupancy point towards higher levels of competition to attract customers between

the hotels in the location. High levels of competition may prompt the hotels to aggressively use ICT based technologies both for attracting customers as well as to increase the efficiency of its operations.

The firm related factors considered are: (i) the size of the hotel in terms of the number of rooms, (ii) the scope of activities of the hotel in terms of activities that the hotel was engaged in, (iii) the grade of the hotel, and (iv) the age of the hotel. Some of these factors have been found to have significant impact on the adoption of internet by Wei et al (2001) in a study conducted among managers in the hotel industry.

The size of the hotel has an important effect on ICT adoption propensity. Effective adoption of several ICT technologies requires a substantial investment of resources. Lack of resources may affect the inclination of small hotels to adopt costly ICTs and therefore large hotels can be expected to be more inclined to ICTs. Further the risky nature of investing in new technologies may prompt small hotels to wait till the technology has stabilized before investing in it. Another aspect of the hotel size that can influence adoption propensity is the inclination to change within the organization. Large hotels have been found to be more resistant to change than small firms. This fact tends to suggest that large hotels are less inclined to adopt ICTs than small hotels as long as the investment required is not a consideration.

The scope of activities that the hotel is engaged in can also influence its propensity to adopt ICTs. Since ICTs enable an effective integration of activities of an organization, hotels with varied lines of activities would find more use in the adoption of ICTs than hotels with a relatively lesser

span of activities. Hotel grade which indicate the economic class of the hotel’s target customers may also influence its propensity to adopt. Luxury Hotels which targets the high economic class may be more inclined to adopt ICTs due to the demand by the customers as well as to enhance their image. Also hotels of a higher grade will be more equipped in terms of resources for adopting new technologies. The age of the hotel is also a major factor that influences ICT adoption since new hotels find it easier to adopt new technologies that need a complete revamp of the existing system. Several technologies like the installation of an organization wide property management system will require a large scale reorganization of the firm which will be highly resisted in an old hotel and will be much easily accomplished in a relatively new ones.

The study thus analyzes the impact of the seven factors - (i) the percentage of consumers who visit the hotel’s location from high internet penetration countries, (ii) the overall market size of the hotel’s location, (iii) the level of competition between the firms in the locality, (iv) the size of the hotel, (v) the scope of activities of the hotel, (vi) the grade/type of the hotel, and (vii) age of the hotel - on the propensity of a hotel to adopt ICT s.

Measuring the Propensity to Adopt

As discussed before, the propensity to adopt is reflected in the relative time taken by the hotel to adopt a new technology. This shows the hotel’s inclination towards new ICTs. Hotels with high propensity to adopt will thus be adopting technologies much faster than other hotels. Thus a hotel’s propensity to adopt, P, can be measured using the following equation:

$$P_a = \sum_n \frac{1}{\text{Max}[1, t_n - t_{na}]} \times \frac{t_{na}}{\text{Min}[a, t_n]} \dots\dots\dots(1)$$

Where P_a is the hotel A's propensity to adopt ICTs

t_n is the time since the technology 'n' was available in the hotel's location

t_{na} is the time since hotel 'A' has adopted this technology

a is the time since hotel A has been in existence

n is the number of ICT technologies that have been considered

The first part of equation-1 effectively measures the risk taking propensity of the firm. It gives greater values when the firm adopts relatively new technologies, and gives lesser values for adopting relatively old technologies. For instance, a hotel adopting an existing technology which has been found to be of proven value is not a major risky adoption decision. However, adopting a newer technology which is yet to be proven for its utility is a relatively risky decision. The underlying assumption is that the longer the technology has been in existence; the easier it is for a hotel to adopt it since the level of risk associated with an established technology is low.

The second part of the equation measures the innovativeness of the hotel. It is the ratio of the time taken by the hotel to adopt a technology to the time since that technology was introduced. The adoption propensity of a hotel is thus measured in terms of the relative innovativeness of a technology for a hotel and the innovativeness exhibited by the hotel in adopting technologies at an earlier stage of its introduction to the market.

STUDY METHODOLOGY

The study was conducted through a questionnaire survey amongst hotels which had participated in a national level exhibition. 200 hotels of different grades and sizes and from various region of the country had participated in the exhibition. 95 hotels were randomly selected from the 200 odd hotels for the survey. The questionnaire was directly administered to the executives of the hotels.

The hotels considered in the study were located in seven popular destinations in Thailand viz. Bangkok, Phuket, Pattaya, Chiang Mai, Krabi, Samui and Hat Yai. Table - 1 shows the number of hotels selected from each of these destinations. Together these destinations attracted about 24 million visitors in the year 2003, and were expected to attract about 25 million visitors in the year 2004. This includes both foreign and domestic visitors. Also these seven destinations have a total of about 2000 tourist accommodation establishments in 2003. The tourism authority of Thailand defines a tourism accommodation establishment as a place in which rooms are provided for tourists. This includes hotels, resorts, guest houses etc.

“Take in Table I”

Out of the 95 hotels surveyed, 28.4% were small hotels with less than 100 rooms; 49.5% hotels were medium scale hotels with 100 to 300 rooms and remaining 22.1% hotels were large hotels with more than 300 rooms. As far as the room rent is concerned: 22% hotels less than or equal to US\$ 50 per night, 52% hotels US\$ 51-100 per night, and 26% hotels above US\$ 100 per night. The distribution of the hotels according to age: 25% hotels less than 3 years old, 32% hotels 3- 9

years old, 28% hotels 10 – 15 years old and 15% above 15 years old. The following sections describe the operationalisation of the factors considered in the study

Level of internet penetration among the target population of the hotel was measured mostly from the secondary sources of data. This variable measures effectively the percentage of target customers for a hotel who come from a country where the internet penetration was very high. This measure varies across locations. For instance in a destination like Phuket, where the number of visitors from Europe and the USA are higher, the variable will have a higher value than in a destination like Chiang Mai where the number of tourists from countries in Europe and USA are relatively lower. In order to measure this variable across destinations, the split of visitors across nationalities for each of the seven destinations was found out from the Statistical Report for the year 2003 provided by the Tourism Authority of Thailand. The statistical report provides the total number of visitors for a year as well as the split of these visitors across the major countries for each destination. The internet penetration statistics for different countries was obtained from the Internet world stats report (2004). This report provides the percentage of penetration of the Internet among the population of a country from which it is possible to identify countries with more than 50% penetration. Based on this list and the statistics of the dispersion of visitors across countries for a destination, the proportion of visitors for a particular destination hailing from countries with an internet penetration of more than 50% was calculated.

The market size for a location was measured as the total number of visitors who had visited that location. Related statistics were available for all the locations used in the study. The general occupancy rate was also available from the statistical report for each of the locations considered.

The values of the three locational variables e.g. total visitor arrival, percentage of people from high Internet penetration countries, and average occupancy rate for the seven locations are given in Table II.

“Take in Table II”

The size of the hotel was measured in terms of the total number of rooms in the hotel. The scope of operation of the hotel was measured by asking the hotel executives about their lines of activities, like whether they limited their operations to provide just accommodation or they had such other facilities like a convention center, health spa, business center conducted tours etc. The type of hotel signifies the economic segment that the hotel mostly catered to. This was measured on the basis of the average room rent of the hotel. The age of the hotel was ascertained directly from the hotel managers.

The propensity of adoption of the hotels in Thailand were calculated using equation-1 by looking at the adoption time of the hotels across seven ICT facilities which were adopted over the last few decades in the hotel industry in Thailand. The selection of these technologies and the approximate year of their introduction in the hotel industry in Thailand were found out through interviews with experts working in this field as well as from trade journals. Since Thailand is a small country with high priority given to the tourism industry, it is assumed that the technologies were available throughout Thailand during the same time without much variation across the locations. Hence the approximate number of years since the technology was introduced in

Thailand is being used across the seven locations considered in the study. The seven ICT facilities selected with the number of years since they became available is given in Table III.

“Take in Table III”

ANALYSIS

The analysis was carried out by regressing the propensity to adopt a dependent variable with the seven independent variables explained above. The results of the regression analysis are given in Table IV.

“Take in Table IV”

As the multiple regression result show a p-value of 0.000 for the coefficient of differentiation, the model can be considered to be having acceptable levels of statistical significance. The plot of residuals indicates that the data follow the linearity and normality conditions without any homoscedasticity. The tolerance values of the independent variables gave no indication of multicollinearity with the highest tolerance value being less than 0.2. Of the regression coefficients, except for the size of the hotel, and hotel class all the other variables have a significance level less than 0.1. This again goes to indicate a significant impact for the independent variables on the dependent variable. Since the variables were mostly scaled differently, their relative significance can be compared only on the basis of the standardized beta coefficient.

MAJOR FINDINGS

From the regression analysis it can be seen that the size of the hotel has a very small positive regression value (0.01), indicating that it has a very small influence on the adoption propensity of the hotel. Also since the significance level is very low it can be assumed that a hotel's propensity to adopt new technologies is not much affected by its size. Studies done in the past on other sectors for other technologies have in fact been divided on the influence of firm size on the adoption propensity. For instance, while Oster (1982) found a negative impact of firm size on adoption propensity among the US steel industry, Hannan and McDowell (1984), Sommers (1980) and Rose and Joskov (1990) found a positive influence of firm size on adoption propensity across various sectors. The deviation from the past studies may be due to the peculiarities of the tourism industry.

Hotel class seems to have a positive impact over the hotel's propensity to adopt ICTs (regression coefficient 0.17). Hotels of a higher grade are therefore more inclined to adopt new ICT innovations than hotels of a lower grade. This is quite understandable since, from the empirical analysis of the adoption of GDS it was found that the GDS are adopted mostly by hotels of four star and more. The diffusion of GDS to hotels of smaller grades have in fact been found to be quite dismal. Further, ICT facilities like internet in all rooms etc. are demanded mostly by visitors who stay in hotels of higher grade. The scope of activities of the hotel has a positive impact on the hotel's inclination to adopt ICTs. (regression coefficient 0.26). This indicates that hotels with a larger scope of activities have more propensities to adopt ICTs than hotels with a relatively lesser scope of activities. Hotels with a larger scope of activities would probably find ICT based technologies more useful since they need to integrate their activities more efficiently.

The analysis indicates that the age of the hotel has a very high negative impact (regression coefficient -0.32) on a hotel's inclination to adopt ICTs. Thus older hotels are less prone to try out new technologies than newer hotels. Hotels that are new are much more receptive to new technologies like a PMS or wireless Internet or e-checkouts than older hotels. One reason may be because they don't have legacy systems that are costly to replace and also because of the greater belief in the efficacy of the new technologies. Also old hotels may have already achieved a significant reputation amongst its clientele so that they do not feel the urgency for adopting newer technologies to improve their market share.

Among location related factors of the hotel it is seen from the analysis that the location's general occupancy rate has a high negative impact (regression coefficient -0.32) on a hotel's inclination to adopt newer ICTs. A high occupancy rate will mean low competition levels and vice versa. Therefore, the intensity of competition has a positive impact on the propensity of adoption. The result indicates that the hotel in locations where the occupancy rate is less will have a higher propensity to adopt ICTs rather than hotels in location where the occupancy rate is high. When the occupancy rate is lower in a location, there will be increased competition between hotels to both attract customers and serve them better. ICTs and especially such e-commerce based initiatives like e-mail based booking; on-line real time booking enabled by a booking engine, global distribution systems etc. assume greater importance. Such hotels might therefore find it more necessary to adopt ICTs.

Market size of the hotel's location has a positive regression coefficient (0.35) which indicates that the hotels in locations with a large market size will be more interested in adopting ICTs compared to hotels in those locations which are less developed and does not have a high number of visitors. This relationship could be caused by the higher peer pressure in well developed locations with a large visitor population serviced by a large number of hotels. When some hotels in a location start adopting the latest technologies, hotels that do not adopt will rapidly lose their competitive edge. In smaller, less developed locations with lesser number of hotels, the level of peer pressure may not be so strong.

The results also show that hotels which serve a customer base drawn mostly from countries with a high internet penetration display a greater propensity to adopt ICTs rather than hotels which serve relatively lesser number of customers from a high internet penetration country. The regression coefficient has a positive value (0.27) for this factor. Hotels which target customers from such countries have to adopt the latest internet based communication technologies to take advantage of the high internet penetration in those countries. It is therefore important for hotels in such locations to adopt ICTs –especially, the internet based technologies without much delay. Table V summarizes the impact of the factors on the ICT adoption propensity of hotels.

“Take in Table V”

POLICY IMPLICATIONS

With the rapid penetration of the Internet, its use as a medium for communication and transaction is increasing. The study attempts to understand the factors that influence the ICT adoption

propensity in the hotel industry. Thailand being an important tourist destination in the world provides an excellent context for the study. The results from the study provide substantive inputs for policy making both at the micro level as well as the macro level. The increasing dependence of the travel and tourism industry on the information and communication technologies is by now quite well acknowledged (O’Conner, 1999, Buhalis,1998). This dependence is visible across the different stages of the tourism service cycle and its impact has led to a complete transformation of the travel and tourism industry.

As far as the hotel sector is concerned, ICTs have led to greater efficiencies in the service delivery. Further with greater adoption of e-commerce, the hotels are increasingly becoming independent of the conventional channels of distribution like travel wholesalers and tour operators. In a developing country like Thailand due to historical reasons, the dependence on the traditional travel wholesalers is substantially high among hotels. The UNEP (2001), estimates that the tourism leakage in Thailand amounts to about 70% of its total tourism receipts. Most of this leakage is caused due to the outflow of revenue earned by Thailand towards discounts and commissions to Tour operators and Travel wholesalers who are mostly based in developed countries. Information asymmetry and fragmentation of capacity suppliers in the tourism industry provide travel intermediaries with market power. Market structure in the hotel industry is typically characterized by over-capacity in off-peak season, high fixed costs and low variable costs leading to product under pricing. Forward sales of capacity at low contract prices surrender profits from customer surplus to intermediaries enjoying oligopsony benefits (Ryan and Hoontrakul,2004). This situation leads to erosion of profits as well as considerable leakage of tourism earnings to the developed world.

Increasing level of ICT adoption can be looked upon as an effective means to reduce the problem of tourism leakage and information asymmetry. With greater usage of the internet for marketing the hotel property, the hotels could save the commission that they would otherwise be paying to the travel intermediaries. It is observed that hotels that are less dependent on ICTs are the ones who are generally more dependent on travel wholesalers (Hoontrakul and Sahadev, 2005). **The role of the government in promoting adoption of ICTs, government regulation is quite important.** Along with intervention in the demand side like promoting the destinations through mass media campaigns, it is also imperative for governments to intervene in the supply side to mitigate such problems like tourism leakage. For instance a government certified grading system does not exist in Thailand. The existing grading system certified by tour operators does not take into consideration any factor that reflect the level of ICT adoption and usage in a hotel. A government certified grading system that incorporates the ICT adoption levels in hotels on a periodic basis could encourage adoption of ICTs among hotels. At another level, it would also reduce the problem of adverse selection for the customers. To be effective this grading system should also recognize the human resources capabilities in terms of exposure to ICTs in the hotel industry.

At another level, it is seen that hotels that are quite old are least prompted to adopt ICTs. This would lead to a situation where, the older hotels face a decline in quality and therefore their competitiveness over a period of time. In order to prevent such a situation, it is important to help these older hotels to adopt ICTs. Programs like special funding packages may be promoted among the older hotels to adopt ICTs. Further, special promotional program could be devised

where the hoteliers are made to understand the benefits of ICT adoption and encourage them to adopt ICTs.

The analysis shows that ICT adoption is directly proportional to the level of development of the location of the hotel. The level of development is defined here as the total number of tourists who are presently visiting a location. Hotels in locations which attract large number of tourists are found to be more prone to adopt ICTs than hotels in locations which do not attract as many numbers of tourists. This imbalance in ICT adoption would in fact lead to a wide variation in service levels across geographic regions within a country. Further, only those visitors who rely on traditional travel intermediaries will be visiting interior areas since lack of information about these locations acts as a major impediment for these hotels to market themselves. These locations would therefore be increasingly dependent on traditional intermediaries and would loose out on their ability to survive independently. Such a situation would finally lead to major supply side gaps that prevent even interested hotels from adopting ICTs. This would again lead to a lopsided development of the tourism potential in the country. However mass media campaigns to attract customers to these undeveloped areas like the recent campaign developed by the Tourism Authority of Thailand titled 'Unseen Thailand' only exacerbates the situation further. Without addressing the ICT facilities in the supply side, a campaign focusing on new areas will only help the travel wholesalers to consolidate themselves as the new customers who would like to visit these new and exotic destinations will be totally reliant on traditional travel wholesalers.

ICT adoption will allow local level information about hotels to be made available to a global audience thereby reducing to a certain degree of information asymmetry. Greater ICT penetration would therefore reduce the reliance of smaller hotels in undeveloped destinations on

traditional wholesalers. In short TAT should have a supply side policy consistent with their regular demand stimulation policies.

CONCLUSION

The study considers an issue which has not received much empirical attention – ie. the ICT adoption propensity in the hotel industry. The findings give valuable insights into the marketers of ICTs who wish to gain entry into the hotel sector. The study effectively enables suppliers of ICT based facilities a framework for predicting the adoption propensity of their potential customers. The paper also holds policy implications for the tourism administrators specifically with regard to promotion of ICT adoption in the hotel industry in developing countries. It is important to adopt such policies that motivate hotels to adopt ICTs like incorporating the need for ICT developments in grading initiatives, giving support for training or funding for ICT adoption projects in older hotels etc. The paper argues that ICT adoption is important for reducing the phenomenon of ‘tourism leakage’ in a developing country since greater levels of ICT adoption leads to reduced reliance on traditional intermediaries by hotels. It is also felt that overemphasis on demand generation activities without adequately addressing supply side problems only leads to the exacerbation of the problem of tourism leakage.

It is however important to find out more about the factors that influence the adoption propensity of ICTs in the hotel industry. While the study gives a general idea about the impact of various factors, the reasons for such a pattern of impact may have to be explored further.

References

- Buhalis, D (1998), "Strategic Use of Information Technologies in the Tourism Industry", *Tourism Management*, Vol.19, pp.409-421.
- Connolly D. J and Olsen M. D(2000) "An Environmental Assessment of How Technology is reshaping the Hospitality Sector", *Tourism and Hospitality Research*, Vol.3 (1), pp.73 to93.
- Cooper, C., Fletcher, J., Gilbert, D and Wanhill, S (1998) *Tourism Principles and Practice*, Pearson, Essex.
- Hannan, T. H. and Mc Dowell, J. M. (1984) "The Determinants of Technology Adoption: The case of the Banking Firm", *The RAND Journal of Economics*, Vol 15.pp.328-335.
- Hoontrakul and Sahadev (2005*) "Determinants of E-commerce Usage in the Hotel Industry in Thailand: An Empirical Study", paper presented at the Shanghai Economic Forum 2005.
- The Internet World Stats report (2004) available at <http://www.internetworldstats.com/top25.htm>
- Levin, S.G, Levin S. L., and Meisel, J. B (1987) "A Dynamic Analysis of the Adoption of a New Technology: The case of Optical scanners: The Review of Economics and Statistics, Vol.69, pp.12-17
- Nambisan, S and Wang Y (2000) "Web Technology Adoption and Knowledge Barriers", *Journal of Organisational Computing and Electronic Commerce*, Vol. 10, pp.129-147.
- O'Conner P (1999). "Electronic Information Distribution Tourism and Hospitality", CABI Publishing, Cambridge.
- Oster, S (1982) "The Diffusion of Innovation among Steel Firms: The Basic Oxygen Furnace" *The Bell Journal of Economics*, Vol.8, pp.361-377.
- Rogers E. M (1995) *Diffusion of Innovation* 4th edition, New York, Free Press.
- Rose, N. L and Joskov, P. L (1990) "The Diffusion of New Technologies: Evidence from the Electric Utility Industry", *The RAND Journal of Economics*, Vol.21 (3) pp.354-374.
- Ryan, Peter and Pongsak Hoontrakul (2004*) "An Economic analysis of the Tourism Industry – Implications of the Online Travel Intermediary", *Chulalongkorn Journal of Economics*.
- Sommers, P (1980) "The Adoption of Nuclear Power Generation", *The Bell Journal of Economics*, Vol.11 pp.283-291
- TAT (2003), *Statistical Report (20030)*, Tourism Authority of Thailand, Bangkok.

Tornatzky, L. G., and Fleisher, M. (1990), "The Process of Technology Innovation", Lexington, MA: Lexington Books

Wei S., Ruys H. F., van Hoof H. B and Combrink T. E (2001) "Uses of the Internet in the Global Hotel Industry", Journal of Business Research, Vol.54, pp.235 to 241.

UNEP (2001) "Economic Impacts of Tourism" available at ,
<http://www.uneptie.org/pc/tourism/sust-tourism/economic.htm>, accessed on 24/12/2004.

*Freely downloadable at www.Pongsak.Hoontrakul.com

Table I: Hotels considered in various locations

Destination	No. of hotels selected for the study
Bangkok	18
Chiang Mai	8
Hat yai	8
Pattaya	10
Phuket	17
Krabi	15
Samui	19

Table II: Locational variables: values across the seven locations

	Size of the market: total visitor arrivals in 2002 (in million)	Percentage of people from high internet penetration countries (%)	Average occupancy rate (%)
Bangkok	10.7	53.8	63.9
Chiang Mai	2.3	49.5	44.47
Pattaya	3.6	47.1	61.08
Phuket	3.4	62.1	57
Samui	0.754	75	60.51
Hat yai	1.569	18	52.76
Krabi	1.632	50	43.22

Table III: ICT facilities considered and time since their availability

ICT facilities	Approximate no. of years since introduction in Thailand
e-mail based booking	8
On-line real time booking	7
Global distribution system	17
Internet center in the hotel	8
Internet in all rooms	6
Wireless internet in the hotel	3
Local Area Network for back- office	16
Property management software	16
e-check outs from rooms	3

Table IV: The results of the regression analysis

	Unstandardized Coefficients		Standardized Coefficients	t - value	p-value
	Regression coefficient	Std. Error	Beta		
Factors influencing the propensity of adoption					
(Constant)	3.84	1.70		2.26	0.03
Size of the Hotel	0.00	0.02	0.01	0.10	0.92
Hotel Class	0.13	0.09	0.17	1.40	0.17
Age of the Hotel	-0.10	0.03	-0.37	-3.13	0.00
Scope of activities of the hotel	0.14	0.07	0.26	2.01	0.05
Occupancy rate (opposite to Intensity of Competition in the hotel's location)	-0.51	0.26	-0.32	-1.99	0.05
Size of the market at the hotel's location	0.21	0.09	0.35	2.40	0.02
Percentage of customers from high internet penetration countries visiting the hotel's location	0.30	0.17	0.27	1.75	0.09

R	R Square	Adjusted R Square	Std. Error of the Estimate	F-value	p-value
0.602	0.362	0.282	1.556	4.540	0.000

Table V: Summary of the Factors and their impact on ICT adoption propensity

Factors	Impact on ICT adoption propensity
Market size	positive
Proportion of visitors from high internet penetration countries	positive
Occupancy rate	negative
Size of the hotel	Very low positive impact
Grade of the hotel	positive
Age of the hotel	negative
Scope of operations of the hotel	positive