Relationship between information and communication technology (ICT) adoption and hotel productivity: the case of Phuket, Thailand

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Abstract

This study aims to explore the relationship between ICT adoption and the operational and customer productivities in hotel sector in Thailand. Level of ICT adoption was measured by three elements: (i) ICT component availability; (ii) ICT component integration; and (iii) intensity of ICT component used. Hotel productivity comprising operational and customer productivities was calculated by using data envelopment analysis (DEA). The impact of level of ICT adoption on hotel productivity was analyzed through a questionnaire survey among hotel managers and customers from 190 hotels in Phuket, Thailand. It was found that ICT adoption, including ICT availability, ICT integration and the intensity of ICT used, has a significant positive impact on both operational and customer productivities.

Keywords Information and communication technologies (ICT) adoption, operational productivity, customer productivity, hotel productivity, Thailand
1. Introduction

Increasing competition and customer expectation leads hotel firms to search for more competitive advantage. Many hotels have adopted information and communication technology (ICT) as a way to cope with rapidly changing environments. Over the last decade, ICT investments in hotel industry have been greatly increasing. Internet, intranet, e-mail, electronic transaction, central reservation systems and web applications are some of ICT applications that have been broadly implemented throughout the industry (Ham et al., 2005). The hotel managers believed ICT adoption was a key success factor for effective hotel operations (Sigala, 2003; Siguaw et al., 2000). Productivity is one of the important performance indicators for hotel industry since it relates to its efficiency (Ibrahim, 2000 and Johnston et al., 2004). Improving productivity is seen as a key issue for their survival and success in the long term (Jones 1999).

Despite the importance of ICT adoption and productivity, it is surprising that there are only few researches investigating the relationship between them in hotel industry. Moreover, their conclusions, studying in developed countries, are not consistent (Sigala, 2003, David et al., 1996). Therefore, it can be seen that more studies would be required to find out the exact relationship between ICT adoption and hotel productivity especially in developing country such as Thailand. This research investigated the relationship between ICT adoption and productivity in Thailand hotel industry.

Relationship between ICT and hotel productivity

Productivity is very important for hotel industry, since it is the chief reason that the hotel managers decide to install information and communication technologies (ICT) to the hotel (David et al, 1996). However, ICT can be both productivity tool and burden (Baker et al., 1994). Many researchers used various methods to study the relationship between ICT investment and hotel productivity, but their results are not consistent. Some have found that ICT investment could increase hotel productivity or performance (Brown et al., 1999, Reynold, 2003 and Ham et al., 2005). For instance, Ham et al., (2005) proposed that improving productivity is the primary role of information and communication technologies (ICT) in the lodging industry, while information resources have long played a crucial role in conducting successful lodging operations. In the other hand, some researchers concluded that ICT investment can not increase hotel productivity. (David et al., 1996) For example, David et al., (1996) proposed that hotel operators have spent uncounted millions of dollars on computers and information
systems but haven't always achieved enhanced productivity from all those expenditures.

Based on the previous discussion, this study attempted to analyze the impact of the level of ICT adoption comprising - (i) ICT component availability; (ii) ICT component integration; and (iii) intensity of ICT component used - on the hotel operational and customer productivities.

2. Study methodology

From literature review, the hotel productivity can be significantly impacted by the some factors such as competition among hotels in location, demand patterns and variability, customer type, area management style, public utility availability and labor market (Sigala et al., 2001, Kilic and Okumus, 2005, Sahadev and Nazrul, 2005). To control the impact of these factors, the hotel samples should be selected from the same area. In this research, Phuket was selected to be the study area because of three reasons (i) Phuket has the highest percentage of computer possession hotel; (ii) Phuket has the highest percentage of hotel having internet connection and (iii) Phuket has the highest percentage of website possession hotel (National Statistic Office of Thailand, 2007). One hundred ninety hotels of different grades and sizes were randomly selected from the 358 hotels for the survey. One management person and 10 customers of each hotel were selected to complete the questionnaire.

Based on the discussion in the previous section and the in-depth interviews with 20 experts panels, two types of questionnaire; hotel management person and hotel customer questionnaires, were developed. Expert panels included both academic persons and practitioners in Thailand hotel industry. Based on their comments collected during the pilot testing period, items that were not suitable for Thailand environment were eliminated, and items that were not clearly stated were revised. Then, complete questionnaires were developed.

The questionnaire for hotel management person is composed of 3 sections; the ICT adoption, operational productivity and hotel demographic information.

The first section measured the ICT adoption level of each hotel. It can be measured by (i) ICT component availability; (ii) ICT component integration; and (iii) intensity of ICT component used.

The availability of hotel ICT is measured in terms of number of ICT components presently adopted by hotels. These components can be categorized into four groups; room division (RD), food and beverage division (F&B), general and in-room ICTs. The room division ICTs consist of telephone and fax systems, website and email systems, global distribution system (GDS), central reservation system (CRS), check in system, Room status &
housekeeping management systems, guest account management system, customer service system, check out system and statistic and reports system. The food and beverage division ICTs consist table reservation system, food ordering management system, point of sale system, inventory system, menu-costing system and food and beverage report system. The general ICTs consist of property management system, financial and accounting system, marketing and sales system, human resource management system, purchasing system, customer relationship management system, decision support system, wireless internet connection area and business center. The in-room ICTs consists of telephone system, internet access system, room energy management system, automated wake up system, voice mail system, in-room entertainment system and electronic locking system.

The integration or linkage of ICT components was measured by the number of linking between ICT in each categorized group to other group or to main control systems.

The intensity of use of ICT component was measured by the percentage of job done by using ICT. For example, the intensity of check in system used can be measured by asking the hoteliers about the percentage of guest registration that occur through check in system. In this research, the ICT component intensity of use measurement was limited on room division (RD) and food & beverage (F&B) division because of two reasons. Firstly, both of them are the core operations in hotel service (Sahadev et al, 2004 and Sigala et al., 2003). Secondly, the revenue from these two divisions is approximately 80% of Thailand total hotel revenue in 2004 (Thailand national statistical office, 2004).

The second section measured the operational productivity of each hotel. It was measured in term of operational outputs divided by operational inputs.

Operational outputs consist of (i) room revenue: refers to yearly revenues from room sales; (ii) food and beverages revenue: refers to yearly revenues from hotel restaurants, coffee room and night club; (iii) ICT revenues: refers to yearly receipts from telephone, fax and internet service; (iv) room occupancy rate: refers to yearly total number of occupied rooms divided by total number of rooms; and (v) seat turnover rate: refers to yearly average number of times each seat in a restaurant is occupied per day.

Operational inputs consist of (i) operating expenses: including yearly housekeeping expenses, yearly food and beverage expenses, yearly telephone, fax and internet service expenses and yearly repair, maintenance and license expenses of computer accessories and cost of training (ii) payroll expenses: including salaries, service charge and bonus of room and food and beverage division.
employees; (iii) total number of guest room: refers to number of available guest rooms in the hotel; and (iv) seating capacity of restaurant: refers to number of available guest seating in the hotel restaurant.

The last section included six hotel demographic items: type, location, age, star rating, available room type and yearly average room rate per night.

The questionnaire for hotel customer is composed of 2 main sections; customer productivity and customer characteristic information.

The first section measured customer productivity. Similarly to operational productivity, it was measured in term of customer outputs divided by customer inputs.

Customer outputs consist of 5 items.

(i) customer satisfaction in room division service.

(ii) customer satisfaction in food and beverages division service.

All items concerning customer satisfaction in room division and food and beverages division services were rated on a 5-point, Likert-type scale ranging from 1 (highly dissatisfied) to 5 (highly satisfied).

(iii) Customer intensity level to recommend to others

(iv) Customer intensity level to repurchase

(v) Customer judgment about value of money

A five-point Likert type scale anchored from 1 (not very likely) to 5 (very likely) was used for each question in item (iii) – (v).

Customer inputs consist of 5 items.

(i) Cost in using hotel service.

(ii) Time spent in room division service usage.

(iii) Time spent in food and beverage division service usage.

(iv) Customer effort level in room division service usage.

(v) Customer effort level in food and beverage division service usage.

All items concerning Customer effort level in room division and food and beverages division services were rated on a 5-point, Likert-type scale ranging from 1 (highly inconvenient) to 5 (highly convenient).

The second section included seven customer characteristic items: occupation, location, age, education, country, room reserve channel and number of times customer have stayed in hotel.

3. Analysis

Descriptive characteristics of the respondents

Among the 190 hotels surveyed, 62.1 percent of hotel surveyed were resort hotel, 16.3 percent were boutique hotel, 13.2 percent were guesthouse and 8.4 percent were business/city hotel. As far as the room rate is concerned, 52.1 percent of hotels charged less
than 3,000 baths per night, 21 percent charged 3,000 – 6,000 baht per night, and 26.8 percent charged above 3,000 baht per night. The distribution of the hotel age was as follows: 4.2 percent of hotels were less than three years old, 33.2 percent of hotels were 3-9 years old, 30.6 percent of hotels were 10-15 years old, and 18.9 percent were more than 15 years old. Concerning hotel size, 48.9 percent were small hotels with less than 100 rooms, 37.8 percent were medium-scale hotels with 100-250 rooms, and the remaining 13.2 percent were large hotels with more than 250 rooms. Moreover, 43.7 percent were 3 star hotels, 27.4 percent were 5 star hotels, 15.8 percent were 4 star and 13.2 percents were less than 2 star hotels.

The hotel customers were also surveyed. Among 1,900 respondents, 52.3 percent were female, and 47.7 percent were male. The distribution of the hotel customer age was as follows: 41.3 percents of respondents were under 29 years old, 30.2% percent were 30 - 40 years old, 9.7 percent were 40 – 50 years old and the remaining 18.8 percent were more than 50 years old. Concerning respondent occupation, 36.1 percent were government officer, 25.0 percent were student and 14.5 percent were service provider, 12.6 percent were entrepreneur and the remaining 11.8 percent had other occupation. Concerning customer education, respondents who graduated from high school accounted for 41.5 percent, respondents who had completed the bachelor degree 43.1 percent, while respondents who had graduated master degree or above were 15.4 percent. The distribution of the respondent country was as follows: 32.8 percent of hotel customers came from Europe, 27.7 percent came from North America, 14.2 percent came from Oceania, 13.9 percent came from Asia, and 11.4 percent came from South America. Approximately, 23.4 percents of respondents had duration of stay in the hotel less than 3 days, 62.5 percent had duration of stay in the hotel 3 – 5 days, and 14.1 percent had duration of stay in the hotel more than 5 days.

**ICT adoption level results**

The distribution of the ICT availability and integration level is shown in table 1 and 2, respectively. Telephone and fax systems were the most heavily adopted ICT attracting 98.9 percent of the respondents, followed by check in system (95.8 percent), in-room telephone system (95.3 percent), check out system (90 percent) and marketing and sales system (88.4 percent). ICT integration levels were lower than the availability levels. There are only three from eight ICT linking, having integration level more than 50 percents. Linking between hotel ICT components and main control systems or main server was preferred to adopt.
Table 1. Availability level of ICT (percent of respondents)

<table>
<thead>
<tr>
<th>ICT</th>
<th>Availability (Percent of respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Room Division ICT</strong></td>
<td></td>
</tr>
<tr>
<td>Telephone and fax systems</td>
<td>0.989</td>
</tr>
<tr>
<td>Website and email systems</td>
<td>0.700</td>
</tr>
<tr>
<td>Global distribution system (GDS)</td>
<td>0.295</td>
</tr>
<tr>
<td>Central reservation system (CRS)</td>
<td>0.289</td>
</tr>
<tr>
<td>Check in system</td>
<td>0.958</td>
</tr>
<tr>
<td>Room status &amp; housekeeping management systems</td>
<td>0.253</td>
</tr>
<tr>
<td>Guest account management system</td>
<td>0.232</td>
</tr>
<tr>
<td>Check out system</td>
<td>0.900</td>
</tr>
<tr>
<td>Customer service system</td>
<td>0.226</td>
</tr>
<tr>
<td>Statistic and reports system</td>
<td>0.253</td>
</tr>
<tr>
<td><strong>F&amp;B Division ICT</strong></td>
<td></td>
</tr>
<tr>
<td>Table reservation system</td>
<td>0.826</td>
</tr>
<tr>
<td>Food ordering management system</td>
<td>0.574</td>
</tr>
<tr>
<td>Inventory system</td>
<td>0.253</td>
</tr>
<tr>
<td>Point of sale system</td>
<td>0.184</td>
</tr>
<tr>
<td>Menu-costing system</td>
<td>0.253</td>
</tr>
<tr>
<td>Food and beverage report system</td>
<td>0.653</td>
</tr>
<tr>
<td><strong>General ICT</strong></td>
<td></td>
</tr>
<tr>
<td>Property management system</td>
<td>0.865</td>
</tr>
<tr>
<td>Marketing and sales system</td>
<td>0.884</td>
</tr>
<tr>
<td>Human resource management system</td>
<td>0.505</td>
</tr>
<tr>
<td>Purchasing system</td>
<td>0.479</td>
</tr>
<tr>
<td>Financial and accounting system</td>
<td>0.147</td>
</tr>
<tr>
<td>Decision support system</td>
<td>0.068</td>
</tr>
<tr>
<td>Wireless internet connection area</td>
<td>0.221</td>
</tr>
<tr>
<td>Customer relationship management system</td>
<td>0.184</td>
</tr>
<tr>
<td>Security system</td>
<td>0.089</td>
</tr>
<tr>
<td>Business center</td>
<td>0.474</td>
</tr>
<tr>
<td><strong>In-Room ICT</strong></td>
<td></td>
</tr>
<tr>
<td>Internet access system</td>
<td>0.526</td>
</tr>
<tr>
<td>Room energy management system</td>
<td>0.679</td>
</tr>
<tr>
<td>Automated wake up system</td>
<td>0.053</td>
</tr>
<tr>
<td>In-room entertainment system</td>
<td>0.368</td>
</tr>
<tr>
<td>Voice mail system</td>
<td>0.042</td>
</tr>
<tr>
<td>Electronic locking system</td>
<td>0.074</td>
</tr>
<tr>
<td>Telephone system</td>
<td>0.953</td>
</tr>
</tbody>
</table>
Table 2. Integration level of ICT (percent of respondents)

<table>
<thead>
<tr>
<th>ICT</th>
<th>Integration (Percent of respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking between room division ICT and other division ICT components</td>
<td>0.132</td>
</tr>
<tr>
<td>Linking between room division ICT and main control systems or main server</td>
<td>0.721</td>
</tr>
<tr>
<td>Linking between food and beverage division ICT and other division ICT components</td>
<td>0.116</td>
</tr>
<tr>
<td>Linking between food and beverage division ICT and main control systems or main server</td>
<td>0.558</td>
</tr>
<tr>
<td>Linking between general ICT and other division ICT components</td>
<td>0.111</td>
</tr>
<tr>
<td>Linking between general ICT and main control systems or main server</td>
<td>0.758</td>
</tr>
<tr>
<td>Linking between in-room ICT and other division ICT components</td>
<td>0.179</td>
</tr>
<tr>
<td>Linking between in-room ICT and main control systems or main server</td>
<td>0.237</td>
</tr>
</tbody>
</table>

The intensity of ICT component used results is shown in Table 3. Check in and check out systems were the most heavily used ICT for room division (79 percent), followed by website and email systems (55 percent). Reservation system was the most heavily used ICT for food and beverage division (56 percent).

Table 3. The intensity level of ICT components used

<table>
<thead>
<tr>
<th>ICT</th>
<th>Intensity of ICT component used (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD ICT</td>
<td></td>
</tr>
<tr>
<td>Telephone and fax systems</td>
<td>44.211</td>
</tr>
<tr>
<td>Website and email systems</td>
<td>55.526</td>
</tr>
<tr>
<td>Global distribution system (GDS)</td>
<td>7.632</td>
</tr>
<tr>
<td>Check in system</td>
<td>79.145</td>
</tr>
<tr>
<td>Room status &amp; housekeeping management systems</td>
<td>22.632</td>
</tr>
<tr>
<td>Guest account management system</td>
<td>20.132</td>
</tr>
<tr>
<td>Check out system</td>
<td>79.342</td>
</tr>
<tr>
<td>Customer service system</td>
<td>19.474</td>
</tr>
<tr>
<td>Statistic and reports system</td>
<td>23.947</td>
</tr>
<tr>
<td>F&amp;B ICT</td>
<td></td>
</tr>
<tr>
<td>Table reservation system</td>
<td>56.592</td>
</tr>
<tr>
<td>Food ordering management system</td>
<td>42.066</td>
</tr>
<tr>
<td>Inventory system</td>
<td>18.053</td>
</tr>
<tr>
<td>Point of sale system</td>
<td>13.066</td>
</tr>
<tr>
<td>Menu-costing system</td>
<td>16.737</td>
</tr>
<tr>
<td>Food and beverage report system</td>
<td>48.566</td>
</tr>
</tbody>
</table>
Operational and customer productivity results

This paper adopted data envelopment analysis (DEA) using multiple inputs and outputs to measure the hotel productivity. In this research, DEAFrontier software was used for computing both operational and customer productivities. DEAFrontier consists of a series of DEA softwares which are Add-Ins for Microsoft® Excel developed by Joe Zhu. It uses Excel Solver as the engine for solving the DEA models. Based on CCR model, the operational and customer productivities of 190 hotels were obtained. The results were summarized and shown in table 4.

Table 4. Operational and customer productivity DEA score of hotel

<table>
<thead>
<tr>
<th>DEA Productivity score</th>
<th>Percentage of hotel (operational productivity)</th>
<th>Percentage of hotel (customer productivity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>26.84</td>
<td>15.79</td>
</tr>
<tr>
<td>90.00 – 99.99</td>
<td>11.58</td>
<td>4.74</td>
</tr>
<tr>
<td>80.00 – 89.99</td>
<td>17.37</td>
<td>15.79</td>
</tr>
<tr>
<td>70.00 – 79.99</td>
<td>5.26</td>
<td>16.84</td>
</tr>
<tr>
<td>60.00 – 69.99</td>
<td>8.95</td>
<td>18.95</td>
</tr>
<tr>
<td>50.00 – 59.99</td>
<td>12.11</td>
<td>20.53</td>
</tr>
<tr>
<td>Less than 50</td>
<td>17.89</td>
<td>7.37</td>
</tr>
</tbody>
</table>

ICT adoption affecting hotel productivity

Pearson correlations were conducted to identify whether ICT adoption level had significant effects on hotel productivities. The results are presented in Table 5.

4. Major Findings

Significant Pearson correlations among the number of general and in-room ICT revealed both operational and customer productivity impacts. That means the availability of these ICT can enhance employee efficiency, reduce cost and increase revenue. For example, room energy management system can reduce energy cost, reduce work load for hotel housekeepers. It also increases customer satisfaction since it is convenience for the customer to go out with out turning off the electronic equipment. The number of room division ICT was found to be significant ICT availability affecting only the customer productivity. That means the availability of room division ICT enhance the hotel cost, reduce the hotel profit, but it can increase the customer satisfaction and loyalty that are necessary for long-term success. In contrast with room division ICT, the number of F&B division ICT was found to be significant ICT...
availability affecting only the operational productivity. Since most of F&B division ICT was used by hotel staffs for enhancing staff efficiency and providing better management. Customer has a little involvement in F&B division processes, so little customer productivity enhancement from F&B division ICT availability was expected. However, when consider in the overall picture, the number of hotel ICT, including number of ICT in all division, was found to be significant ICT availability affecting the operational and customer productivities.

For ICT integration, significant Pearson correlations among the number of room division ICT and in-room ICT integration revealed both operational and customer productivity impacts. That means room division ICT and in-room ICT integration provided satisfied performances for both hotel and customer side. For example, when the customers used the telephone in their room, the telephone fee was calculated and recorded at the guest account system. It is convenience for both hotel staff and customer to handle with. The number of F&B division ICT integration was found to be significant ICT integration affecting only the customer productivity.

Table 5. Effect of ICT adoption level on hotel productivity

<table>
<thead>
<tr>
<th>ICT Availability</th>
<th>Operational Productivity</th>
<th>Customer Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson</td>
<td>P value</td>
</tr>
<tr>
<td>Number of ICT in Room Division</td>
<td>0.101</td>
<td>0.166</td>
</tr>
<tr>
<td>Number of ICT in F&amp;B</td>
<td>0.199</td>
<td>0.006</td>
</tr>
<tr>
<td>Number of General ICT</td>
<td>0.183</td>
<td>0.011</td>
</tr>
<tr>
<td>Number of In-room ICT</td>
<td>0.180</td>
<td>0.013</td>
</tr>
<tr>
<td>Number of Hotel ICT</td>
<td>0.473</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICT Integration</th>
<th>Operational Productivity</th>
<th>Customer Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson</td>
<td>P value</td>
</tr>
<tr>
<td>Number of RD ICT Integration</td>
<td>0.236</td>
<td>0.001</td>
</tr>
<tr>
<td>Number of F&amp;B ICT Integration</td>
<td>0.048</td>
<td>0.510</td>
</tr>
<tr>
<td>Number of General ICT Integration</td>
<td>0.158</td>
<td>0.029</td>
</tr>
<tr>
<td>Number of In-room ICT Integration</td>
<td>0.153</td>
<td>0.035</td>
</tr>
<tr>
<td>Number of Hotel ICT Integration</td>
<td>0.635</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intensity of ICT Component Used</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Room Division ICT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone and fax systems</td>
<td>-0.237</td>
<td>0.001</td>
</tr>
<tr>
<td>Website and email systems</td>
<td>0.582</td>
<td>0.000</td>
</tr>
<tr>
<td>Global distribution system</td>
<td>-0.118</td>
<td>0.104</td>
</tr>
<tr>
<td>Check in system</td>
<td>0.672</td>
<td>0.000</td>
</tr>
<tr>
<td>Room status &amp; housekeeping</td>
<td>0.379</td>
<td>0.000</td>
</tr>
</tbody>
</table>
management systems
Guest account management system
Check out system.
Customer service system
Statistic and reports system

F&B Division ICT
Table reservation system
Food ordering management system
Inventory system
Point of sale system
Menu-costing system
Food and beverage report system

Similar to room division ICT availability, although the hotel profit was decreased, the customer satisfactions were increased. For instance, it is more comfortable for the customers, if the dinner cost at hotel restaurant could be sent to the room division system. Thus, they could pay only one time when they checked out. In contrast to general ICT integration, the number of general ICT integration was found to be significant ICT integration affecting only the operational productivity. Since the general ICT linkings were mostly used within hotel internal process, it is not affected to customer satisfaction. In the overall picture, the number of hotel ICT integration was found to be significant ICT integration affecting the operational and customer productivities.

Significant positive Pearson correlations between the intensity of ICT used productivity scores than those having lower percent of ICT components usage. The impact of intensity of GDS usage is not found on hotel productivity. If the hotel has high percentage of GDS using, it means most of the hotel customers comes from intermediate or tourist agent channel. The cost of this reservation channel is high, comparing to telephone or website channel, because of high commission cost. As a result, it leads to lower profit and low productivity. Therefore, ICT productivity benefits can only be realized when hotel has high percentage of the intensity of ICT usage. To achieve that success, hotel staff training and service process/operation redesign are also required before hotel productivity benefits are realized.

5. Conclusion
Improving productivity is seen as a key issue for their survival and success in long term for hotel industry. Many hotels adopted ICT for that purpose. However, few researches investigating the relationship between them.
This research was conducted to find out the relationship between ICT adoption and hotel productivity in Phuket, Thailand. DEA methodology was used to calculated operational and customer productivities. The relationship between ICT adoption and hotel productivity was tested by Pearson correlation.

Results reveal that the degree of ICT adoption, including ICT availability, ICT integration and the intensity of ICT used, has a significant positive impact on both operational and customer productivities. Thus, for optimizing ICT value, ICT adoption in all three dimensions is necessary. Hotel manager should have strategic plan to implement and manage these ICT dimensions. Not only the ICT component purchasing and linking, but staff training and process reengineering are required for hotel success.

Moreover, the ICT productivity accessing must be performed in both operational and customer dimension. Some ICT components adoption (e.g. room division ICT availability) did not provide the operation profits, but it provided the customer benefits. The ICT outcome may be appearing in the long run. It indicated that a threshold ICT investment level is required before sufficient benefits are realized.

This research conducted in a dataset of hotel in Phuket. Future research could investigate productivity in different locations or countries. Cross countries studies can also produce interesting results with crucial academic and managerial implications.

Reference


