Information technology investment analysis of hospitality using information economics approach

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Abstract

This study aims to determine the feasibility of IT investment in hospitality and determine the value and tangible/ intangible benefits from IT implementation. Problem arises from high investment without knowing the real impact and future investment to IT development. The scope of this research is information technology investment in five star hotel in Jakarta. The data were collected by distributing questionnaires to the research samples, are Grand Hyatt Hotel, Mandarin Oriental Hotel and Ayana Midplaza Hotel Jakarta. The analysis uses the information economics (IE) approach that combines financially and non-financial calculations to determine the feasibility of IT investment and the benefits of IT for 5-star hotels in Jakarta. From the analysis result, it can be concluded that five star hotel in Jakarta is feasible to make IT investment with ROI score more than 1 and scorecard value 28 which shows that IT investment in 5-star hotel is quite beneficial for hotel business process.

Keywords: five star hotel, hospitality, information economics, information technology investment

1. Introduction

Nowadays hospitality thinks that technology can improve business effectiveness and efficiency. Hospitality in Indonesia, especially Jakarta was competing to provide the best service in terms of information and technology. Moreover, implementation of IT is one of strategies to improve hotel performance [1]. The need for technology is increasingly needed as the level of hotel guest satisfaction starting from check-in process until check-out [2]. Based on previous research, IT implementation at the hotel has been started since 1980s until 1990an, many hotels that invest millions of dollars for information technology about 4.4 million dollars [3]. This will continue and the number of investments will increase as the development of information technology in hospitality has an impact on improving service quality, reducing costs, increasing productivity, gaining competitive advantage, and improving bottom line profitability [4-6]. Gaining competitive advantage [7] such as, IT security investments may stop the competitors to absorb market power. From other studies that point to problems appearing in hospitality to find out if the IT they invested is effective, [8] asserts that many hospitality companies have no procedures to see how effectively their spending on information technology is. Based on other research, it is found how to look at the characteristics of IT investment decision making in the field of hotel with empirical research [9] by means of financial evaluation, and second research is investment evaluation on system that has been applied will influence investment feasibility [10] financially and non-financially using Information Economics approach.

Various sources of data that show about IT investment in the hotel, then the problem is the existence of large amount of investment for IT development without understanding IT effectiveness for the hotel [11], the managerial party who difficult to give data about the values and intangible/tangible benefits. To find out how IT decisions are worth doing, and the benefits and IT used by 5-star hotels in Jakarta, one with the Economic information (IE) method. IT investment is an investment in equipment, applications, services and basic technology [12, 13]. According to [14], an IT investment consists of the total life cycle cost of an entire project or project chunk that involves IT, including the post-project operating cost of the system that was implemented. The investment ceases to exist when it is replaced or eliminated for any reason.
Evaluating expense or impact of large IT investment may vary from study to study [15]. In order to evaluate IT investment, Information Economics (IE) is a set of calculating tools to measure the benefits and costs of an information technology project. IE is the development of CBA (Cost Benefit Analysis) so that, IE methods focus on the analysis of benefits and costs associated with the value of business performance. Information Economics that evaluate the feasibility based on non-financial will show the quantitative perspective [16] and improve business outcomes. As described in Figure 1, in the development of IE connects business performance and information technology. The benefits of IT/IS that organizations use can be viewed by combining Simple ROI analysis and analysis of technology and business domain.

2. Research Method

This study using Information Economic approach in order to do feasibility assessment that combine technology domain and business domain. Moreover, there are few phases using IE approach consists of 1) Data Collection Phase; this stage is formulating of of IT/IS conditions and the needed of IT/IS at the hotel industry, specifically in Jakarta. Secondary data was collected from journal, text book and Indonesian Hotel Association [18, 19] as well as annual final report [20-22] from samples of 5-star hotels. It aims to obtain data that could be used in weighting corporate values phase. The data collected includes the financial data of 5-star hotels and IT projects undertaken, as well as the costs for the technology used today. This stage is also done spread the questionnaire online for intangible value analysis of business domain and technology domain. 2) Analysis using Information Economics Phase. After the data was collected, the data would be processed for analysis on the financial aspects of tangible value analysis and quasi tangible value. Tangible value analysis is done with traditional cost-benefit analysis resulting ROI and first economic impact. While the analysis of Value Linking (VL), Value Acceleration (VA), Value Restructuring (VR) aims to measure the benefits of quasi tangible value.

The feasibility of IT investment can be known ROI score generated on the economic impact sheet. According to [23], to calculate simple ROI, there are three worksheets, such as: development cost sheet using ratio, ongoing work sheet, and economic impact sheet. The final value of the ROI and the scores of corporate analysis is incorporated into the IE Scorecard showing the value and benefits of IT investments in 5-star hotels in Jakarta. At the same time, we doing non-financial analysis with analysis on Domain Business and Domain Technology obtained from questionnaire results. After getting ROI1, we doing the quantification of VL, VA with intangible benefits factors in the business domain and technology are added up with ROI1. 3) Conclusions; from the results of the analysis conducted, it will be concluded on the economic impact sheet to determine the feasibility of IT investment based on ROI score and IE Scorecard. Balance scorecard will evaluate corporate performance [24] from corporate value perspective. Those phases are outlined below on Figure 2. The Scores on the IE Scorecard will show the value and benefits of investment for IT. It will help the company to take further IT investment
decisions. According to [25], software complexity could be reduced. Relate to [26], business process model could be derived from goal model.

![Research Methodology](image_url)

**3. Results and Analysis**

**3.1. Collecting Data Result**

The results of questionnaire are short profile about the sample. Based on the results of literature studies, it shown the architecture and information technology projects in 5-star hotels are consists of five area, such as: (1) Application Services Monitoring, this application is used to perform records, services monitoring hotel, employee work schedules in payroll process for hotel employees. In the three samples of 5-star hotels, there are using fingerprint or card, which will be calculated for overtime, or schedule replacement. In general, overtime occurs during high season such as long school holidays, or holidays. 5-star hotels that have overseas mothers generally follow the parent hotels using well-known apps/systems such as with FCS Computer System, Oracle, with servers in their host city hotel. (2) Intranet and Wireless connection.

The huge demand for the Internet makes many hotels present the speed and bandwidth that can satisfy the guests. (3) Online Reservation. The 5-star hotels in Jakarta work with online reservation providers in Indonesia such as traveloka.com, agoda.com and globally with airbnb.com. With online reservation integrated with housekeeping department for processing rooms. (4) E-Concierge Service Management. Service to entertain hotel guests and modern travelers is currently working with smartphones in the form of E-Concierge Mobile with technology called Mobile Guest Softphone (MGS). This app uses a new solution from ALE (Alcatel-Lucent Enterprise) that maximizes the experience for the guests and improves the operational performance of the hotel. The MGS allows guests to make free wireless connection calls, allow guests to call reception/room service, process faster check-in and check-out, and use other facilities just by hand. (5) IT Security, the problem that arises when using IT in a company/organization is its security. For companies/organizations and even hotels are also very vulnerable to information that can harm the hotel in case of cyber attack.

**3.2. Analysis Tangible Value Result**

In order to perform the tangible value analysis, it takes balance sheet and income statement obtained from the three samples. The result of calculation of tangible value showed on economic impact sheet of three samples in Table 1. According to Table 1, ROI score 1 of economic impact sheet Grand Hyatt Hotel, means that the IT investment is feasible. Highest score for simple ROI means that IT implementation give profitability to the hotel.

According to Table 2, Mandarin Oriental Hotel ROI score is 1. This score means that the IT investment is feasible. Above 100% for Simple ROI means that IT implementation give profitability to the hotel and able to invest more in the future. According to Table 3, ROI score for Ayana Midplaza Hotel is 2. means that the IT investment is feasible. Above 400% for simple ROI means that IT implementation is good to financial performance and suggested to invest more in the future. In conclusion based on economic impact sheet from three samples, IT investment in 5-star hotel is feasible.
Table 1. Economic Impact Sheet of Grand Hyatt Hotel

| A | Yearly Cash Flow | Net Investment Required ($M) | Net Economic Benefits |
|---|------------------|------------------------------|-----------------------|
|   | year 1 | year 2 | year 3 | year 4 | year 5 | Total |
|   | 186 |
| Operating Cost Reduction = Pre-tax income |
| (-) on-going expense |
| net cash flow |
| C | Simple ROI | Score | Simple ROI |
|   | 298 |
| D | ROI score | Score | Simple ROI |
|   | 612 |

Table 2. Economic Impact Sheet of Mandarin Oriental Hotel

| A | Yearly Cash Flow | Net Investment Required ($M) |
|---|------------------|------------------------------|
|   | year 1 | year 2 | year 3 | year 4 | year 5 | Total |
|   | 65.6 |
| Operating Cost Reduction = Pre-tax income |
| (-) on-going expense |
| net cash flow |
| C | Simple ROI | Score | Simple ROI |
|   | 65.8 |
| D | ROI score | Score | Simple ROI |
|   | 453.1 |

Table 3. Economic Impact Sheet of Ayana Midplaza Hotel

| A | Yearly Cash Flow | Net Investment Required ($M) |
|---|------------------|------------------------------|
|   | year 1 | year 2 | year 3 | year 4 | year 5 | Total |
|   | 111 |
| Operating Cost Reduction = Pre-tax income |
| (-) on-going expense |
| net cash flow |
| C | Simple ROI | Score | Simple ROI |
|   | 400 |
| D | ROI Score | Score | Simple ROI |
|   | 2384 |

3.3. Analysis Quasi-Intangible Value Result

Value Linking approach implemented in 5-star hotel, implementation online reservation and e-Concierge management, hotel guests can quickly make room reservations and guest data collection will be better. For e-Concierge the process of entering guests to the room will also be easier. Value Acceleration. The use of applications based on three samples of 5-star hotels in Jakarta can make the process and performance faster. Value Restructuring. Implementation IT investment in IT project of 5-star hotel, the occurrence of restructuring on job function.

3.4. Analysis Intangible Value Result

The intangible value assessment taken from questionnaire before. The questionnaire itself divide to two categories, for business domain and technology domain. The results shown...
by score 1-5 which will be weighted into economic impact sheet and IE Scorecard. The result of technology domain divided for Strategic IS Architecture, Infrastructure Risk, Defitional Uncertainty, dan Technical Uncertainty. For Technical Uncertainty have specific characteristic, are required skills, hardware dependency, software dependency and application dependency. Meanwhile the result of business domain divided for Strategic Match, Competitive Advantage, Managemen Information, Competitive Response, dan Organizational Risk. Table 4 showed business domain and technology domain scores from samples based on factors that influenced both domains.

Table 4. Business and Domain Technology Score

| Factors             | Score |
|---------------------|-------|
| Business Domain     |       |
| 1 Strategic Match   | 1     |
| 2 Competitive Adv.  | 1     |
| 3 Management Info.  | 4     |
| 4 Competitive Resp. | 4.5   |
| 5 Organizational Risk| -2    |
| Technology Domain   |       |
| 6 Strategic IS Arch.| 4.5   |
| 7 Definition Unc.   | -4    |
| 8 IS Infrastructure | 0.5   |
| 9 Technical Unc.    | -4    |

3.5. Corporate Value Result

5-star hotels in Jakarta are in the investment quadrant position because 5-star hotels have a solid business base, have the time and opportunity to invest in the future. As shown on Figure 3, the value of the 5-star hotel corporation in Jakarta is 20 and the negative value is 10. This value showed that 5-star hotels in Jakarta have the time and opportunity to invest more in the future. Therefore, it is necessary to focus on future growth and development of existing infrastructure.

3.6. Information Economics Result

The assessment related to corporate relative factors that are contributive to the hotel’s operational services, which are more contributive factors will be given a positive value, while high risk will be given a negative value. As shown on Figure 4, the results of the assessment with information economics scorecard obtained value is 28 with enough category. It can be concluded that IT implementation and IT projects in 5-star hotels in Jakarta are quite useful. E-Concierge, mobile apps and online reservation are most valuable and success investment for 5-star hotel. But, in order to improve the performance of hotel IT, which in terms of security and improve hotel services, need a system improvement in accordance with the hotel program, so it can support the vision and mission of 5-star hotels in Jakarta.

Figure 3. Corporate value result calculation  Figure 4. Result of information economic analysis

4. Conclusion

The result of financial analysis that is calculated ratio and processed in economic impact sheet obtained simple ROI and can be concluded that in terms of cost, IT investment in 5-star hotels in Jakarta can provide economic benefits for the hotel. The result of weighting the corporate value with a positive score of 20 and negative 10. This score indicates that 5 star
hotels in Jakarta are included in the investment quadrant. The investment quadrant shows that a 5-star hotel has a solid business base, has the time and opportunity to invest in the future. The 5-star hotels in Jakarta also have the time and opportunity to invest more in the future. Therefore, it is necessary to focus on future growth and development of existing infrastructure. Recent conclusions show that IT projects and IT investments made currently in 5-star hotels in Jakarta provide benefits for the continuity of hotel services, financially and non-financially. The economic value of IT investment in 5-star hotels can be seen on IE score of 28 which is in the range of 14-40 score with enough category. This value indicates that IT investment in 5-star hotel in Jakarta is considered economical enough, and quite helpful and useful in supporting hotel business process.

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