



Evaluation of Historical Building Economic Value To Improve Company Revenue With Value Engineering Method

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Abstract: Historical buildings have high historical, cultural, and architectural values. This research aims to provide an overview of the economic benefits for building owners when utilizing the building. Case studies, the qualitative methods and Value Engineering were used in this research. This study identified three building functions to add economic value and are feasible in terms of investment value. The buildings are a budget hotel, restaurant/cafeteria, and co – working space. IRR value for budget hotels is 14.29%; the NPV value is IDR 58,375,939,253; 14 years payback; the distribution of the financing scheme 30% landowners and 70% investors; 30-year concession. Restaurant / café and co – working space; the value of IRR is 12.47%; the value of NPV is IDR 4,727,841,299.58; Payback 8 years. This research is useful for historic building owners, government, and academics to utilize their assets to have economic value.

Keywords: Feasibility, Economic value, Heritage Building, Qualitative Method, Value Engineering

INTRODUCTION

Heritage buildings have strong multiple values (architectural, historical, cultural, aesthetic, social, symbolic, authenticity, and economic value. As an added economic value, heritage can be used as commercial, residential, or tourism, which offers cultural experiences for tourists. The nearby populace additionally utilizes the cultural services produced by the heritage properties. The economic value will be a cultural heritage for future generations[1]. The study case conducted by Ruijgrok in Netherland found that the benefits bigger than the cost of renovation for ten years based on the present value method. The study is divided into three categories: a housing comfort value, a recreation value, and a bequest value. The hedonic pricing method (HPM) was used for monetizing technique. Contingent Valuation Method (CVM) was used respectively[2]. Historic buildings have the main attraction in the form of old buildings from historical relics in the Dutch era considered able to attract tourists to visit. The existence of historic museums also adds historical value to the region. However, based on the exposure of the 2016 – 2019 priority tourism destination development by the Tourism Ministry, the number of foreign tourists visiting according to 2014 data was around 116,461. This number is still far behind compared to the old city of Sukhothai, Thailand, which can attract 1,000,000 tourists, and the city of Malacca, Malaysia, which was even able to attract 3,900,000 tourists in 2014.

The lack of visiting tourists compared to the two countries is influenced by the lack of facilities and infrastructure in the old town and surrounding areas. In addition, some buildings in the old city area that are not well maintained also influence tourists' interest to visit. The needs of the increasing economic value of heritage building required several solutions, and one of which is an additional function.

However, cost efficiency is an essential aspect of choosing an alternative. [3] – [5] The method that appropriates these challenges is needed to gain efficiency and increase the budget's effectiveness. Value engineering is one of the ways which increase project value through the analysis of the function.[6] Value engineering is systematically proven of cross border discipline knowledge for system analysis of creating an optimum result of the function [7]

The building used for this research case study is in Kota Tua Jakarta, and its current condition is rented out for offices at a low price. There is a target of increasing income by building owners and being part of cultural heritage buildings for DKI tourism; there is a need for maximum effort for this writing. The development of tourism potential in the old city of Jakarta is reviewed using the Value approach.

Research Question

1. Identify what functions in a heritage building?
2. How are the fast diagrams arranged?
3. How to analyze financial feasibility based on Value Engineering?

Literature Review

Many factors of property value to consider in evaluating the economics of building reuse. Mason categories between economic and conservation discourse. Conservation discourse consists of historical narratives and materials science, a financial lesson on quantitative expressions, and defers to markets' judgment as efficient means of making decisions and allocating resources. Most studies have shown a positive correlation between property value increases and historic preservation. Use value is defined as the value readily traded on the market; for example, the cost of a building in the real estate market. Non-use value is defined as value for which a market does not exist, i.e., aesthetic value, spiritual value, social value, historical value, symbolic value, and authenticity value. Both contemporary values stand out in decisions about conservation and development, and they are directly linked to the historical and cultural core values of the place[8], [9]

The rate of heritage properties is different with a valuation of assets or other property because the heritage properties are not actively traded in the market. The uniqueness of inheritance makes it difficult to judge by conventional means. The newest innovative methods used in valuing inherited property are the stated preference (SP) and expressed preference (RP) methods.[10]

Esteem designing may be a precise estimate to discover the finest utilitarian adjust between taken a toll, unwavering quality, and venture execution. It can be characterized as an orderly intrigue examining the various factors that affect the fetched of an extend or benefit for the instruments to realize the required destinations most financially with decreased benchmarks of quality and unwavering quality. Esteem designing could be a group exertion. It points to advance esteem mindfulness and increment the level of professional competence and innovative greatness in organizations. Esteem building not as it pointed at a fetched decrease. Still, to cost-effectiveness, which increments the esteem and provides a competitive advantage ([6] Value Building is applying a valuation strategy to an extend or benefit that has been arranged or conceptualized to attain expanded esteem. The value methodology is a systematic process used by multidisciplinary teams to increase the value of a project by analyzing its functions [7]. Value Engineering is a problem-solving system implemented using specific techniques, science, expert teams, creative organized approaches. It aims to identify and eliminate unnecessary costs such as costs that do not contribute to a quality, useful life, and appearance products consumer appeal [11]. The value engineering methodology's central concept lies in the value with the relationship between functions and costs [12]. The increased added value should be created for the built environment to maximize the potential contribution to the performance of the natural and economic environment. The VM method can be applied to generate values in the form of additional functions in buildings. [13] Value Engineering (VE) is a method that arises because many costs are not needed in a project plan. Value Engineering (VE) is an evaluation method used to analyse project resources. New alternatives are used to generate more efficient and effective costs and time to increase benefits and earnings for contractors and owners. [14]

Net Present Value is the difference between the current cash inflow and recent cash outflows. The advantages of the NPV method considered the time value of money; all existing cash flows; the risk of cash inflows in the future; it can find out whether the investment value can increase company value or not [15]. Economic valuation techniques of the most popular and the most advanced are the NPV approach. It consists of discounting all future cash flows (both inflows and outflows) resulting from an innovation project by a specific discount rate and then summing them up. The benefits of innovation are measured by considering their contribution to creating economic value from the required investment. This technique offers many variations [16]

IRR analysis determines the expected level of return from a project. Therefore, the NPV is equal to zero. The higher IRR value leads to the greater project's profit. Therefore, it is possible to get funding

with a lower interest than the IRR value [17]. The internal rate of return is the return rate on the investment made by investors because calculations are simple and meet the need to know a project can be compared.

METHODOLOGY

The data collection method used in the formulation of problem 1 was secondary data through literature studies. The samples used were international and national journals. Furthermore, after obtaining a list of functions, interviews were conducted with experts. Interviews were conducted with an open – ended questionnaire with data that had been acquired by the literature review, and it is possible to add functions if needed. The results that have been obtained in the second stage were calculated using the economic feasibility analysis formula, as the economic feasibility was calculated by summing the IRR, MARR, NPV, and Payback analysis [15]

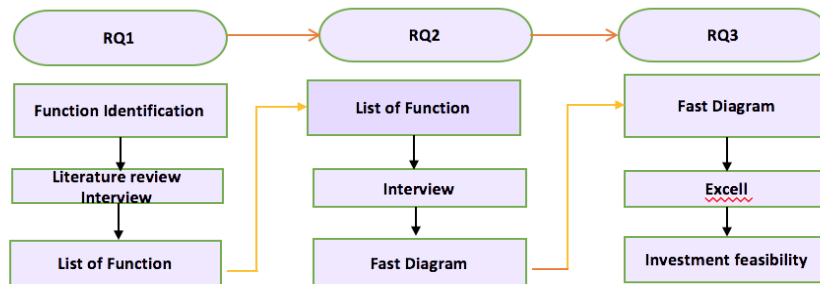


FIGURE 1. The Research flow diagram

RESULT AND DISCUSSION

To answer first research question (RQ 1), the building function was identified based on the literature review. This step required benchmarking on how beneficial the heritage buildings in overseas (Netherlands and Malaysia). Benchmarking is very useful for gaining the descriptive of comparing structure using in similar type. The phase began by determining the scope of the VE study's problem then was continued by identifying the function based on the existing design concept of the planned facilities. We defined into two categories: leisure and hobby consist of the exhibition room, merchandise store, restaurant / café, budget hotel and working, consist of the office lease .

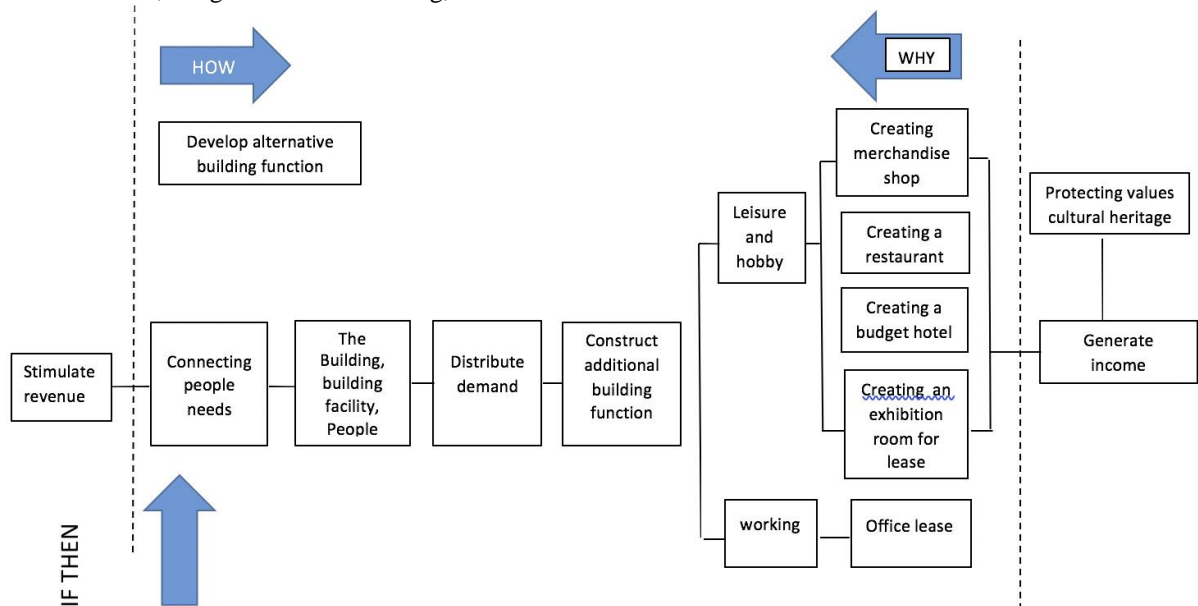


FIGURE 2. Existing Fast Diagram

To answer the second research question (RQ 2), after gaining a list of the functions then the three experts were interviewed to validate the variables. The expert's qualification was based on their minimum 5-year experience for handling heritage buildings in a managerial position. The result of validation process was 2 of 5 variables were chosen, and there is one additional function, coworking space, as illustrated in table 1

TABLE 1. The result of function identification

No	Category Function	Variable	Expert			Decision	Reason
			1	2	3		
1	X1	Restaurant	V	V	V	Recommended	Marketable
2	X2	Merchandise store	X	X	V	Not Recommended	Many merchandise stores are located around the building
3	X3	Budget Hotel	X	V	V	recommended	Marketable, limited budget hotel in Kota Tua area
4	X4	Office lease	X	X	V	Not Recommended	Not marketable, as the building existing is used for office lease
5	X5	Exhibition room	X	X	X	Not Recommended	The space is limited
6	X6	Coworking space	X	X	X	Additional function recommendation	1. Considering the current condition where the need to work independently and not tied to a specific place has become a contemporary work trend. 2. The location is strategic location lies in the city center in Old Town in Jakarta.

The fast creativity diagram is illustrated in figure 3. The identified functions consists of Budget Hotel, Restaurant/Café, and co – working space.

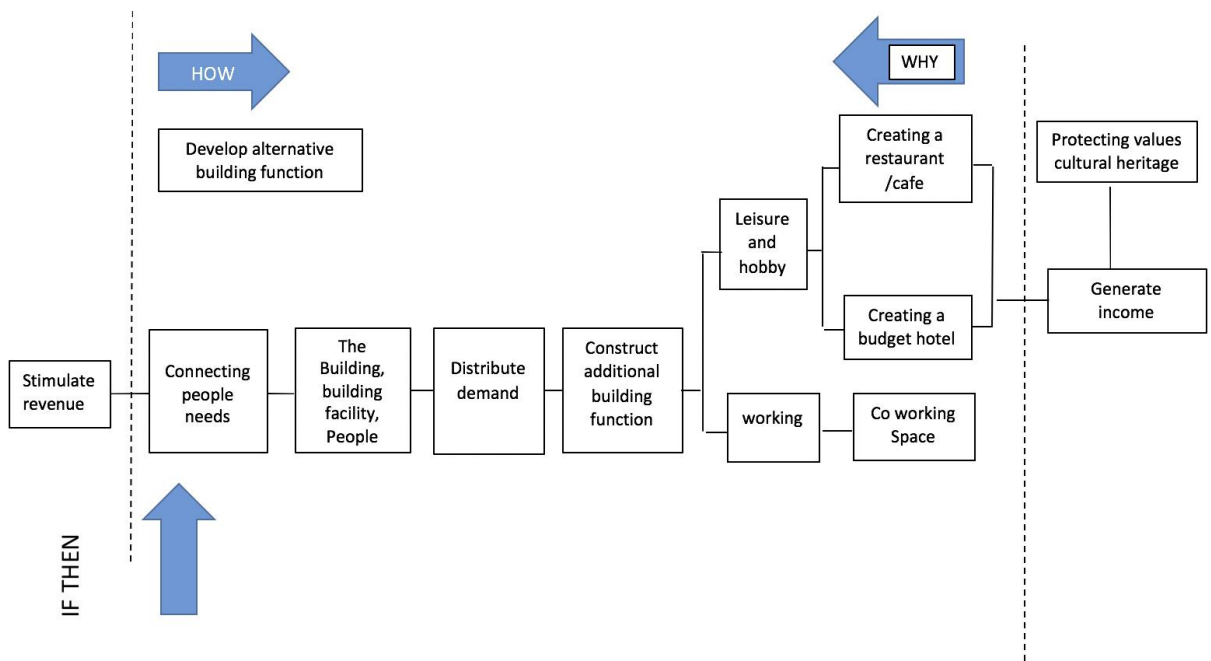


FIGURE 3. Creativity Fast Diagram

To answer the third research question (RQ 3), the feasibility study was analyzed. IRR, NPV, Payback period, and financial scheme among owners and investors were used.

a. Budget hotel:

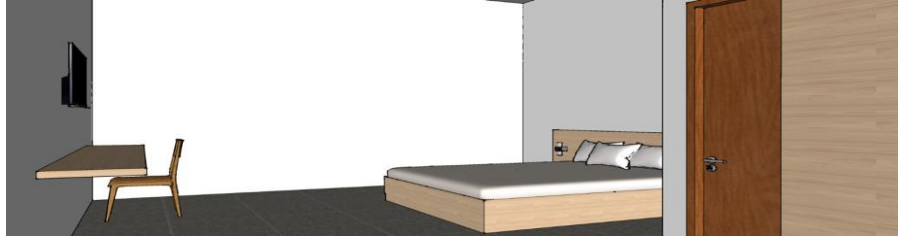


FIGURE 4. Design of Budget Hotel

TABLE 2. Financial Plan Budget Hotel

Description	Value
Initial Cost (Renovation cost)	IDR 1.155.466.403 ,- / room
MARR	12%
Concession	30 years
Inflation (Average Inflation in 10 years)	4.78%
Occupancy	80%
Rate average/night	IDR 227.500
The fluctuated rate /year	10%
OM	40% revenue

TABLE 3. Feasibility Study Analysis

Land owner	Investor	IRR	NPV (IDR)	Payback Period
30%	70%	14,29%	58.375.939.253	14 years
25%	75%	14.45%	58.628.384.854	14 years
20%	80%	14,62%	58.880.830.463	14 years

Table 2 shows that the concession for this project is 30 years. Table 3 describes that we can use a profit – sharing maximum of 30% for the owner, which obtains IRR 14,29%, NPV 58.375.939.253, and a payback period of 14 years.

b. Restaurant /Café atau coworking space



FIGURE 5. Design of Restaurant



FIGURE 6. Design of Co – working Space

TABLE 4. Financial Plan Restaurant / co – working space

Description	Value
Land area	618 m ²
fluctuated rate of rent	10% per year
Renovation Price	IDR 5.000.000- per m ²
Building rent	IDR 600.000- per m ²
MARR	12%
The economic value of the building	20 Tahun
Inflation (Average Inflation in 10 years)	4.78% (BPS)
OM	5% revenue

TABLE 5. Feasibility study analysis

Building rent cost (/ m ² / year)	IRR	NPV	Payback Period
IDR 300.000.000,-	6%	IDR 3.234.337.594,17	Nine year
IDR 360.000.000,-	12,47%	IDR 4.727.841.299,58	8 year
IDR 400.000.000,-	14%	IDR 5.403.247.199,52	8 year

From table 5, it can be seen that the development of building leases for Restaurant / Café / Co – working space to these tenants can cost a rental fee of IDR 360,000,000 per year for a building with an area of 600 m² or IDR 600,000 per m² per year is financially feasible. Figure 5 is a co – working space design that can used as additional building functions.

CONCLUSION

In a heritage building that serves as a pilot project, its functions can be identified: Budget Hotel; restaurant / café; coworking space. This three functions were chosen based on a feasibility study considered a suitable part and economic value. Fast Diagram is prepared based on identifying its tasks and determining three functions, which consisted of Budget Hotel; restaurant / café; coworking space. Project feasibility analysis is as follows: Budget Hotel: the value of IRR is IRR 14.29%; the amount of NPV is IDR 58,375,939,253; 14 years payback; the distribution of the financing scheme 30% landowners and 70% investors; concession 30 years: Restaurant / café and co – working space the IRR value is 12.47%; NPV 4,727,841,299.58; Payback 8 years. The pilot project in this research was the buildings in DKI Jakarta. As a result, there are differences in land and building prices compared to areas outside Jakarta. Further research should be carried out outside DKI Jakarta to determine the feasibility of studying other heritage buildings if the building functions are added. I would like to thank University Mercu Buana for funding the research.

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