

Feasibility Study of East Surabaya Hospital Investment and Its Contribution to Surabaya City's Development Goals

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Abstract

This study aims to analyze the investment feasibility of constructing the East Surabaya Hospital and its alignment with the strategic development goals of Surabaya City. The methods employed include investment feasibility analysis using indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PP), as well as a socio-economic approach to evaluate the project's impact on the community. The findings indicate that, financially, the project is not viable, as indicators like Return on Investment (ROI) and Profitability Index (PI) yield negative results. However, from the perspective of sustainable development, the project aligns with the priorities of Surabaya City's RPJMD, including improving access to healthcare services, creating jobs, and strengthening the local economy. The project also has the potential to generate positive impacts on social welfare, quality of life, and workforce productivity. Therefore, despite its financial infeasibility, the project's relevance to the city's strategic needs remains significant. This study recommends adopting innovative financing schemes such as Public-Private Partnership (PPP) to address financial challenges. Such schemes not only enhance the project's sustainability prospects but also engage various stakeholders to ensure more effective implementation. With this approach, the hospital construction can support the achievement of Surabaya City's sustainable development goals.

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INTRODUCTION

The development of urban infrastructure is a critical factor in enhancing the quality of life and fostering sustainable growth. Surabaya City, as one of Indonesia's prominent urban centers, has emphasized public welfare and improved public services as key priorities in its development agenda. Among the critical sectors identified for improvement, healthcare plays a central role due to its significant impact on social well-being and economic productivity (Devi Indah Erlita et al., 2022). With rapid population growth and shifting demographics, the demand for high-quality healthcare facilities in Surabaya continues to rise. In this context, the construction of a new hospital in East Surabaya emerges as a strategic solution to address the growing healthcare needs while aligning with the city's broader development goals (Agni, 2022).

Healthcare is a vital pillar of sustainable development, as recognized by global frameworks like the Sustainable Development Goals (SDGs). Ensuring equitable access to healthcare is essential for fostering long-term social stability and economic progress (Shidqy Fauzan Putranida & Reza Nanda Nugraha, 2022). In Surabaya, data from the Central Bureau of Statistics reveal an increasing demand for healthcare services due to population growth, changes in disease patterns, and heightened public awareness of health-related issues. However, disparities in healthcare access, particularly in areas such as East Surabaya, remain a challenge that necessitates targeted interventions to enhance both the capacity and quality of healthcare infrastructure (Jati et al., 2024).

The construction of East Surabaya Hospital is not only a response to immediate healthcare needs but also a strategic investment with far-reaching socio-economic benefits (Faizah & Panjawa, 2020). High-quality healthcare facilities improve access to essential services, enhance public health outcomes, and boost workforce productivity. Furthermore, hospitals serve as economic catalysts, creating job opportunities, attracting skilled professionals, and stimulating local businesses. However, such large-scale investments require thorough feasibility assessments to ensure they are financially viable and capable of delivering sustainable benefits. Financial indicators like Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PP) are critical tools for evaluating these aspects and mitigating potential risks (Dahlia et al., 2022; Herlambang et al., 2023).

While financial feasibility is crucial, the social impact of the hospital project must also be carefully considered. The establishment of a hospital in East Surabaya can significantly reduce healthcare disparities, improve public access to affordable medical services, and contribute to overall social equity (Darmayanti & Rustariyuni, 2019). These outcomes align with the priorities outlined in Surabaya City's RPJMD, which emphasizes inclusive development and equitable service delivery. By addressing both economic and social dimensions, the hospital project has the potential to support the city's sustainable development objectives and enhance the quality of life for its residents (Nurhayani et al., 2022; Hematyar et al., 2019).

Based on data from the Surabaya City Health Office in 2023, the East Surabaya area shows a disparity between the number of healthcare facilities and the growing population and healthcare service demands. There are only five general hospitals in this region, with a hospital bed-to-population ratio that falls below the WHO standard of one bed per 1,000 residents. This indicates an urgent need for the development of new healthcare facilities, particularly hospitals, to ensure equitable and quality access to health services in East Surabaya. Therefore, the proposed hospital development project in this area is a critical response to support the local healthcare system.

This study aims to analyze the investment feasibility of the East Surabaya Hospital and evaluate its alignment with the strategic development goals of Surabaya City. Through a comprehensive feasibility analysis using methods such as NPV, IRR, and PP, as well as

assessments of social and economic impacts, the research seeks to determine the viability of this investment. The study also explores potential strategies to maximize the project's contributions to the city's sustainable development, offering insights into its financial and societal implications.

RESEARCH METHODOLOGY

Investment feasibility analysis is a process of assessing the potential returns on investment while accounting for the inherent risks and uncertainties of the project (Damodaran, 2012). Through this method, it is possible to measure whether the investment's value can generate returns exceeding the incurred capital costs. Accordingly, this study conducts various analyses of the feasibility of investing in the development of the East Surabaya Regional Public Hospital (RSUD). Based on Haris (2019), the following methods are used to assess the feasibility and potential profitability of an investment:

Net Present Value (NPV)

Net Present Value (NPV) reflects the present value of the income generated from an investment. It is determined by calculating the discounted value of all cash inflows and outflows related to the project.

$$NPV = \sum \left(\frac{C_t}{(1+r)^t} \right) - C_0$$

Formula Explanation:

C_t = Expected cash flow in year t

r = Discount rate (expected rate of return)

C_0 = Initial investment cost

NPV Decision Criteria:

NPV > 0: The project is profitable and feasible.

NPV < 0: The project is unprofitable and not feasible.

NPV = 0: The project breaks even, recovering the initial investment

Internal Rate of Return (IRR)

Internal Rate of Return (IRR) is the interest rate at which the Net Present Value (NPV) of cash inflows equals the initial investment. It indicates the real rate of return generated by the investment. A project is deemed viable if the IRR surpasses the target rate of return.

$$IRR = i1 + \frac{NPV1}{NPV1 - NPV2} \times (i2 - i1)$$

Formula Explanation:

IRR = Discount rate where NPV = 0

$i1$ = Interest rate when the last NPV is positive

$i2$ = Interest rate when the last NPV is negative

NPV1 = Last positive NPV

NPV2 = Last negative NPV

A project is said to be feasible if the IRR is higher than the desired rate of return.

Payback Period (PP)

Payback Period (PP) calculates the duration needed to recoup the initial investment. It assesses the speed at which the investment produces sufficient cash inflows to cover the original outlay

- A. The Payback Period formula if the cash flow per year is a different amount is shown in the equation

$$PP = n + \frac{(a - b)}{(c - b)} \times 1 \text{ tahun}$$

Formula Explanation:

a : Initial investment amount

b : The total cumulative cash flow achieved by the end of year *n*

c : The cumulative cash flow recorded in the subsequent year, *n*+1

n : The final year in which the cumulative cash flow remains insufficient to fully recover the initial investment

- B. The formula for calculating the Payback Period when the annual cash flow remains consistent is expressed in the following equation:

$$PP = \frac{\text{investasi awal}}{\text{arus kas}} \times 1 \text{ tahun}$$

Formula Explanation

Total Initial Investment ÷ Annual Cash Flow

Decision Criteria:

Faster payback period: The project is feasible. Longer payback period: The project is not feasible

Return on Investment (ROI)

Return on Investment (ROI) Evaluates the profitability of an investment by determining the ratio of the profit earned to the initial investment expenditure

$$ROI = \frac{\text{Profit}}{\text{Investasi}} \times 100\%$$

Formula Explanation:

Profit = Net profit from the investment

Investment = Initial investment cost

Decision Criteria:

ROI > 0: The investment is profitable.

ROI = 0: The investment breaks even.

ROI < 0: The investment incurs a loss.

Profitability Index (PI)

Profitability Index (PI) Assesses the proportion of the present value of projected future cash inflows relative to the initial investment cost.

$$PI = \frac{NPV + I_0}{I_0}$$

Formula Explanation:

PI = Profitability Index

NPV = Net Present Value (NPV)

*I*₀ = Investment Value

Decision Criteria:

PI > 1: The project is feasible and profitable.

PI = 1: The project breaks even.

PI < 1: The project is not feasible.

Discounted Payback Period (DPP)

The Discounted Payback Period (DPP) is a technique for determining the time needed to recoup the initial investment. This method adjusts cash flows received in each period by discounting them based on the time value of money. Future cash flows are converted into present value using a specified discount rate, such as an interest rate or an expected return rate. The formula for calculating the DPP is presented in the following equation.

$$DPP = \frac{\text{Investasi Awal}}{DNPV}$$

Formula Explanation:

Initial Investment ÷ Discounted Net Present Value (DNPV)

DNPV = (PV Year 1 + PV Year 2 + PV Year 3 + PV Year 4 + PV Year 5)

Decision Criteria:

Shorter DPP indicates higher feasibility.

Average Rate of Return (ARR)

Average Rate of Return (ARR), is an investment assessment method used to calculate the average rate of return expected from a project over its lifetime. ARR provides an overview of the level of profit that can be expected from the investment. The formula used to calculate the ARR value can be seen in the following equation

$$ARR = \frac{\text{Average Annual Net Income}}{\text{Average Investment}} \times 100\%$$

Formula Explanation:

Average Annual Net Income = Average annual net profit expected to be generated by the project

Average Investment = Average initial investment required for the project.

Eligibility criteria:

ARR > Expected rate of return = The project is considered profitable.

ARR < Expected rate of return = Projects are considered unprofitable

RESULTS AND DISCUSSION

Initial Expenditures

Based on data obtained from the Electronic Procurement Services of Surabaya City (LPSE Surabaya), the initial expenditures for the construction of the East Surabaya Hospital are as follows:

Table 1.
Initial Expenditures

No	Description	Volume	Total
1	Construction Work for East Surabaya Hospital	1 Package	IDR 494,603,098,000.00
2	Preparation of Traffic Impact Analysis (ANDALALIN)	1 Package	IDR 157,842,000.00
3	Preparation of Environmental Impact Analysis (AMDAL)	1 Package	IDR 519,313,500.00
4	Construction Management Fee	1 Package	IDR 3,349,980,000.00
5	Medical Equipment	1 Package	IDR 148,380,929,400.00
Total			IDR 647,011,162,900.00

Cash Flow

The projected cash flow was calculated based on revenue and expenses derived from inpatient and outpatient service costs at a Type B Regional Public Hospital in Surabaya. The calculation assumes an 80% Bed Occupancy Ratio (BOR) as per Ministry of Health Regulation (Kementerian Kesehatan RI, 2022), adjusted for inflation based on the average inflation rate from 2019 to 2024. The following table provides a summary of the projected cash flow for East Surabaya Hospital:

Table 2.
Cash Flow

No	Description	Interest	Inflation	Revenue (IDR)	Expenditure (IDR)
1	Cash Flow 2024	10%	2.82%	42,315,460,000.00	40,199,687,000.00
2	Cash Flow 2025	10%	2.82%	46,547,006,000.00	41,333,318,173.40
3	Cash Flow 2026	10%	2.82%	51,201,706,600.00	42,498,917,745.89
4	Cash Flow 2027	10%	2.82%	56,321,877,260.00	43,697,387,226.32
5	Cash Flow 2028	10%	2.82%	61,954,064,986.00	44,929,653,546.11
6	Cash Flow 2029	10%	2.82%	68,149,471,484.60	46,196,669,776.11
7	Cash Flow 2030	10%	2.82%	74,964,418,633.06	47,499,415,863.79
8	Cash Flow 2031	10%	2.82%	82,460,860,496.37	48,838,899,391.15
9	Cash Flow 2032	10%	2.82%	90,706,946,546.00	50,216,156,353.98
10	Cash Flow 2033	10%	2.82%	99,777,641,200.60	51,632,251,963.16
11	Cash Flow 2034	10%	2.82%	109,755,405,320.66	53,088,281,468.53
12	Cash Flow 2035	10%	2.82%	120,730,945,852.73	54,585,371,005.94

Source: Author's Analysis, 2024

The cash flow projections illustrate a gradual increase in revenue and expenditure over the years. Revenue growth is influenced by an annual interest rate of 10%, while inflation impacts the cost of services and operations. These projections serve as the basis for further financial feasibility analysis using indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PP).

Net Present Value (NPV)

The calculation of Net Present Value (NPV) for the East Surabaya Hospital development is presented as follows:

Table 3.
NPV Calculation

NPV Calculation For East Surabaya Hospital Development			
Discount Rate (r)	Year 0	PJM 1 (2025-2029)	PJM 2 (2030-2035)
10.00%	2024	2025 - 2029	2030 - 2035
Cash Flow Year 1-10 = $Co \times (100\% + (r)t)$			IDR 1,678,180,325,372.41
Cash Flow	IDR 647,011,162,900.00	IDR 839,090,162,686.21	IDR 839,090,162,686.21
Present Value	Fixed	$Ct / [(1 + r)^5]$	$Ct / [(1 + r)^{10}]$
Present Value	IDR 647,011,162,900.00	IDR 521,008,973,981.04	IDR 323,505,581,450.00
NPV	IDR 197,503,392,531.04 (+) Positive		

The positive NPV of IDR 197,503,392,531.04 indicates that the project is financially feasible.

Internal Rate of Return (IRR)

The IRR calculation for the East Surabaya Hospital is shown below

Table 4.
IRR Calculation

IRR Calculation For East Surabaya Hospital Construction			
r = diskonto / Interest	Year 0	PJM 1	PJM 2
10.00%	2024	2025 - 2029	2030 - 2035
Cash Flow	-IDR 647,011,162,900.00	IDR 521,008,973,981.04	IDR 323,505,581,450.00
IRR	21.63%		

Source: Author's Analysis, 2024

The IRR of 21.63% exceeds the discount rate of 10%, indicating the project is financially viable.

Payback Period (PP)

The Payback Period calculation for the East Surabaya Hospital is as follows:

Table 5.
Payback Period Calculation

PP Calculation For East Surabaya Hospital Construction	
PP	Initial Investment : Annual Net Cash Inflow x 1 Year
	IDR 647,011,162,900.00 X 1 Year
	IDR 35,679,631,336.70
18.1 Years	

Source: Author's Analysis, 2024

The PP result of 18.1 years indicates a relatively long period to recover the initial investment, suggesting lower attractiveness.

Return on Investment (ROI)

The ROI calculation for the East Surabaya Hospital is as follows:

Table 6.
ROI Calculation

ROI Calculation For East Surabaya Hospital Construction	
ROI Return on Investment	((Profit - Investment) / Investment) x 100%
	IDR 35,679,631,336.70 - IDR 647,011,162,900.00 x 100%
	IDR 647,011,162,900.00
-94%	

Source: Author's Analysis, 2024

A negative ROI of -94% indicates the project generates a financial loss based on current projections. The negative Return on Investment (ROI) suggests that the expected returns from the project are lower than the initial capital invested. This result may be influenced by several factors, such as the high upfront construction and equipment costs that are not matched by proportionate annual revenues in the early years of operation. Additionally, the hospital may require a longer time to reach optimal occupancy rates and service capacity, which in turn delays profit generation. These aspects need to be considered in revising the project's financial planning or adjusting its implementation timeline.

Profitability Index (PI)

The PI calculation for the East Surabaya Hospital is as follows:

Table 7.
PI Calculation

PI Calculation For East Surabaya Hospital Construction	
PI Profitability Index	<u>Present Value of Future Cash Flows</u>
	<u>Initial Investment</u>
	IDR 66,145,574,846.79
	IDR 647,011,162,900.00
0.102	

A PI of 0.102, being less than 1, indicates that the project is not financially profitable. The unfavorable Profitability Index (PI), which is less than 1, indicates that the present value of the project's future cash flows does not justify the initial investment. One of the contributing factors may be the use of a high discount rate, which significantly lowers the present value of anticipated income. Moreover, if operational efficiency is not optimized or if there is limited market demand in the early stages, it can negatively affect the projected cash inflows. These issues point to the importance of reassessing market assumptions, operational strategies, and financing approaches to improve the investment's attractiveness.

Discounted Payback Period (DPP)

The DPP calculation for the East Surabaya Hospital is presented below:

Table 8.
DPP Calculation

DPP Calculation For East Surabaya Hospital Construction			
r = diskonto / Interest	Year 0	PJM 1	PJM 2
10.00%	2024	2025 - 2029	2030 - 2035
Cash Flow Tahun 1-10 = Co x (100% + (r)t)			IDR 1,678,180,325,372.41
Cash Flow	IDR 647,011,162,900.00	IDR 839,090,162,686.21	IDR 839,090,162,686.21
Present Value	Fixed	Ct / [(1 + r)^5]	Ct / [(1 + r)^10]
Present Value	IDR 647,011,162,900.00	IDR 521,008,973,981.04	IDR 323,505,581,450.00
DNPV	(PV PJM 1 + PV PJM 2 + PV PJM 3) – Initial Investment		
DNPV	IDR 197,503,392,531.04		
Initial Investment: DNPV			
IDR 647,011,162,900.00		:	IDR 197,503,392,531.04
DPP	3.276 Years		

The DPP result of 3.276 years indicates the discounted cash flows are sufficient to recover the investment within a relatively short period.

Average Rate of Return (ARR)

The ARR calculation for the East Surabaya Hospital is as follows:

Table 9. ARR Calculation		
ARR Calculation For East Surabaya Hospital Construction		
ARR <i>Average Rate of Return</i>	Average Annual Net Income	
		x 100%
	Average Investment	
	IDR 35,679,631,336.70	
	IDR 647,011,162,900.00	100%
		5.51%

Source: Author's Analysis, 2024

The ARR of 5.51% is below the desired rate of return, indicating limited profitability for the project.

Social Impact

Through a systematic literature review, one of the main positive impacts of constructing the East Surabaya Hospital is the improvement of access to healthcare services. By providing a facility closer to the community, residents can receive the necessary medical care more quickly and effectively, which is particularly crucial in emergency situations where rapid response is vital (Razzak et al., 2023; Brury Apriadi Husaini et al., 2020). Additionally, the new hospital will enhance the quality of healthcare services. Modern facilities equipped with the latest technology enable medical professionals to deliver more accurate diagnoses and effective treatments. Improved service quality translates to higher patient satisfaction and better health outcomes.

The construction of the East Surabaya Hospital will not only impact health but also the local economy. The hospital will create job opportunities for medical personnel and support staff, while also attracting investments and fostering economic growth in the surrounding area (Apriliani & Khoirunurrofik, 2020). Socially, the hospital will contribute to increased societal welfare by providing better access to healthcare, reducing mortality rates, increasing life expectancy, and improving workforce productivity (Sunarti et al., 2019).

This development aligns with the objectives outlined in Surabaya City's Regional Medium-Term Development Plan (RPJMD), specifically in enhancing the quality of life, healthcare services, and strengthening the local economy (Di Prinzio et al., 2023). The RPJMD emphasizes increasing accessibility and quality of healthcare services for all citizens. The East Surabaya Hospital addresses this goal by providing advanced healthcare facilities in a previously underserved region, supporting the RPJMD's directive to expand healthcare service coverage (PERDA Kota Surabaya No. 4 Tahun 2021, 2021).

Another priority in the RPJMD is job creation and local economic strengthening. The hospital's construction will not only generate direct employment opportunities but also create a multiplier effect in the local economy (Damarani, F., 2018). This includes the growth of small and medium enterprises (SMEs) in supporting sectors such as food services, transportation, and medical supplies. These developments align with RPJMD policies aimed at empowering the local economy and reducing unemployment. Moreover, by improving access to healthcare, the project contributes to social indicators such as reduced mortality rates, increased life expectancy, and enhanced productivity, aligning with the RPJMD's vision of a healthier, more productive, and

prosperous society (PERDA Kota Surabaya No. 4 Tahun 2021, 2021).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the investment feasibility calculations, the construction of the East Surabaya Hospital is deemed financially unfeasible. Despite positive indicators such as NPV and IRR, other indicators like ROI, PI, and PP suggest that the investment is not ideal from a purely financial perspective. This financial challenge is attributed to high construction and operational costs, coupled with revenue projections that fall short over the given timeframe.

However, from a development and strategic standpoint, as outlined in Surabaya City's RPJMD, the hospital's construction holds significant value. Literature reviews highlight its role in improving accessibility and healthcare service quality, especially for residents in East Surabaya, where advanced healthcare facilities are currently limited. Furthermore, the project aligns with RPJMD priorities in promoting social welfare, improving residents' quality of life, and supporting local economic growth through job creation and economic empowerment. Therefore, while financially challenging, the project is strategically valuable in advancing Surabaya's development goals focused on public welfare and economic strengthening.

Recommendations

To address the financial infeasibility of the East Surabaya Hospital construction, the Surabaya City Government is advised to adopt innovative financing approaches, such as Public-Private Partnerships (PPP) or grants from central government or international institutions supporting healthcare infrastructure development. Integrating the hospital into Surabaya's technology-driven healthcare system is also essential, for example, by leveraging telemedicine services and electronic medical records to enhance operational efficiency and service appeal. Lastly, given the significant social and economic impacts, it is crucial for the government to prioritize this project as a social investment within the RPJMD framework. By emphasizing public welfare, the benefits of the hospital's construction can be realized widely, despite financial challenges, ensuring its alignment with the city's long-term development goals.

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