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Financial Feasibility Analysis of Cenderawasih University Teaching Hospital Building Project

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Abstract:
Acceleration of development in the 3T (Forefront, Outermost and Disadvantaged) areas is the main goal of the government in supporting economic equality and educational services in the land of Papua. So that Cenderawasih University as an extension of the government plans to build a Teaching Hospital to support the activities and development of Cenderawasih University graduates and carry out health services, research and community services. In this study to analyze the feasibility of this teaching hospital project using the NPV (Net Preset Value), BCR (Benefit Cost Ratio), IRR (Internal Rate Ratio), BEP (Break Even Point) and sensitivity analysis methods to determine whether the hospital The project is feasible or not feasible but it is hoped that the results of the analysis are positive.

INTRODUCTION

Accelerating development in the 3T (Frontier, Outermost and Disadvantaged) areas is the government's main goal in supporting economic equality. And in implementing the acceleration of human resource development in Papua, especially in Jayapura City, Cenderawasih University was formed as an extension of the government in creating human resources that are ready to face the rapidly developing fields of science and technology.

Cenderawasih University is one of the favorite universities in Papua, so it is not surprising that every year there are so many interested applicants for new students who almost always exceed the quota of applicants provided. So with this, there is a great demand for additional facilities and infrastructure to accommodate prospective new students. With the increase in the number of Cenderawasih University students every year, the level of need for lecture facilities and infrastructure also increases.

In its development, Cenderawasih University is planning the construction of educational hospital building facilities to be able to support activities and develop graduates from the Faculty of Medicine and to provide services to the academic community of Cenderawasih University itself. As a teaching hospital, Cenderawasih University Hospital has the general goal of providing health services as well as carrying out education, research and community service.

In 2017, construction of the Educational Hospital project under the Ministry of Research, Technology and Higher Education stopped due to budget limitations at the ministry, but in 2022, through the Ministry of Health, the educational hospital project was

resumed as the Papua Vertical Technical Implementation Unit Hospital.

So, based on the background, a feasibility study for the UPT Vertical Papua Hospital building will be analyzed. This research is expected to provide information about one important aspect of a feasibility study, namely the financial aspect. This financial analysis is to review the amount of capital and sources of funds that will be used to build the business as well as when and how the capital can be returned.

The aim of this research is to identify and analyze the financial feasibility of the Papua Vertical UPT Hospital building construction project using the NPV (Net Present Value), BCR (Benefit Cost Ratio) and IRR (Internal Rate of Return) methods. Apart from that, this research also aims to analyze the sensitivity level of the project, as well as determine the Payback Period (PP) as an indicator of the return on investment in the project.

LITERATURE REVIEW

Research conducted by Nurwanda Sari, ST., MT., et al (2020) research on *Preliminary Technical Feasibility Analysis, Operational, Economic Of Radin Inten II International Airports Trains, South Lampung (* preliminary *,* operational and economic feasibility analysis on international airport trains Radin Inten II, South Lampung) The aim of this research is to determine the feasibility of the Radin Inten II International Airport train operating system and implementing *cost benefits* resulting from the operation of the Radin Inten II International Airport train.

Research conducted by Mohammed Ali Berawi, et al (2015) research on *feasibility analysis of the trans-Sumatra toll road using value engineering* (feasibility analysis of the trans-Sumatra toll road using value engineering methods). The aim of this research is to determine the projected income from each additional function TSTR (*Trans Sumatra-Toll Road*) . This is done by analyzing the income generating factors and then organizing them into a CLD (*Casual Loop Diagram*). The feasibility analysis methods used are *Net Present Value* (NPV) *Internal Rate of Return* (IRR) and *Payback Period* (PP).

Research conducted by SA Hasan, et al (2018) research on *feasibility study and economic assessment for Al-Qadisiyah University Hospital of Specialized* Surgery. The aim of this research is to evaluate opportunities. Investment to establish a university hospital with a capacity of 50 beds, the research results show that an internal rate of return (IRR) of (10.6%) and a recovery period of (6) years can be achieved and this project is considered economically feasible.

Research conducted by Feri Eka Irawan, et al (2020) research on the economic feasibility analysis of the construction of the Sadewa building at RSUD KRMT Wongsonegorokota Semarang, the aim of the research is to obtain technical economic feasibility values with the parameters NPV, BCR, IRR, *Payback Period* and Sensitivity Analysis of feasibility values Technical economics is viewed from sensitivity analysis and to obtain the *payback period value* in order to know when the capital will be returned.

Research conducted by Junita Eka Susanti, et al (2019) research on economic feasibility analysis of the Bangka Regency Sports Hall (GOR) construction project, the aim of the research is to analyze investment in the sports hall (GOR) construction project. The analytical tool used in this research is the Financial Aspect Feasibility Study, namely the *Net Present Value* (NPV) *Internal Rate of Return* (IRR), *Payback Period* (PP) method.

Research conducted by Nadya Modisty, et al (2018) research on engineering investment analysis for the construction of public lecture buildings and technical laboratories

at the Sumatra Institute of Technology. The aim of this research is to study whether the existing development is in accordance with the existing feasibility study analysis so that after the construction of the project is carried out the results can be achieved as planned. In this research, financial feasibility is reviewed using the *Net Present Value* (NPV), *Benefit to Cost Ratio* (BCR), *Internal Rate of Return* (IRR), and *Payback Period* (PP) methods.

Research conducted by Dewi Ana Rusim, et al (2018) research on risk modeling and responses to road infrastructure development from the contractor's perspective (case study: construction industry in Papua). The aim of this research is risk modeling and response to cost performance risks in road infrastructure development in Papua.

Research conducted by Shinta Retno Putri, et al (2013) research on financial feasibility studies on the Dinoyo Mall development project, Malang City. The aim of this research is to compare the profits obtained from operational income with investment costs. In its implementation this research uses the *Net Present Value* (NPV), *Benefit to Cost Ratio* (BCR), *Internal Rate of Return* (IRR), and *Payback Period* (PP) methods.).

RESEARCH METHODS

The location of this research was carried out at the Cenderawasih University land area, the kola trikora Bawah water pond complex, Hedam Village, Heram District, Jayapura City at a geographical location of 2°32'15' - 2°42'0' South Latitude and 140°35'0' - 140°40'15' East Longitude.

The following steps will be taken in this research data collection method:

1. Gather information and identify problems.
2. From the information and data that has been collected, investment feasibility analysis, data and calculations are then carried out.
3. Make conclusions.

RESULTS AND DISCUSSION

Currently, the construction of the Cenderawasih University Teaching Hospital (RSP) is being implemented in order to improve medical education by providing facilities and infrastructure for the Teaching Hospital to improve the quality of medical students and public access to services. Maximum health. The development plan for the Cenderawasih University Teaching Hospital (RSP) is planned with Type B in the form of building a Central Hospital, Mother & Child Hospital and Inpatient Building. However, in its development, the educational hospital project was taken over by the Ministry of Health and re-planned to become a UPT Vertical Papua hospital with Type A hospital, so that its implementation requires studies financial feasibility of the project as Wrong one document project planning in completing supporting documents in the hospital construction plan.

The Papua Vertical UPT Hospital is located in Hedam sub-district, Heram District, Jayapura City. The planned building area is as follows:

1. Building area of building A : 16,992.54 m2
2. Building area of building B : 17,129.29 m2
3. Building area C : 3,629.41 m2

Total building area : 37,751.24 m2

The area of green open space: 14,222 m2 which is planned to be used for parks and environmental roads, while the remaining 7,500 m2 of land is used as a green environment and retention pond.

For the planned number of beds in the first stage for Class B hospitals 237 TT and in the next stage for Class A hospitals 320 TT.

From secondary data obtained from the planning team for the UPT Vertical Papua hospital with a building area of **33,720 m2** , so cost Which invested as big as total **Rp. 1,075,850,660,000,-** with details as following:

Table 1
Recapitulation of investment costs for building the Papua Vertical UPT Hospital

No	Description	Investment Amount
1	Physical cost of the building	IDR 701,225,147,000.00
2	Costs for procuring medical equipment	IDR 294,503,003,204.00
3	Costs for procuring office equipment and inventory	IDR 70,122,514,700.00
4	Working capital/working capital	IDR 10,000,000,000.00
	Total investment	**IDR 1,075,850,664,904.00**

Source: Papua Vertical UPT Hospital Planning Consultant Team

Before carrying out a financial analysis on the Cenderawasih University Vertical UPT Hospital building construction project, the components which are the basic reference for this research are first determined, namely in the form of the project funding scheme, construction period, and economic factors at the time the research was carried out.

The basic factors in the financial analysis of the Papua Vertical UPT Hospital project which are used as a reference in the simulations carried out in this research are as follows:

Table 2
Basic factors for financial analysis of the UPT Vertical Papua Hospital building project

PROJECT DESCRIPTION				
Project name	*:*	*Papua Vertical UPT Hospital*		
Location	*:*	*Abepura, Kab. Jayapura, Province. Papua*		
PROJECT TIME LINE				
Construction Period	:	-		
Terms Proportion	:	*1st year*	*2nd year*	
		-%	-%	
Economic Life	:	30	*years*	
Base Year	:	2023		
PROJECT FINANCING COSTS				
Project Finance	:	APBN/ Ministry of Health		
Fund and Debt Portion	:	***Equity***	*+*	***Loans***
Loan and Equity Ratio	:	100%	+	0%
Loans				
Interest Rate (r)	:	0%	*annually*	
Repayment Period	:	0	*years*	
ECONOMIC FACTORS				
Indonesian Corporate Tax	:	25%		
Indonesia Rp Inflation Rate	:	5.75%		
Exchange Rate (Rp/USD)	:	15,292		

Source: Analysis results

Estimated cash inflow (cash inflow)

The component of cash inflow *in* the construction of the UPT Vertical Papua hospital building is revenue, which is obtained from several of the revenues mentioned above.

By assuming an increase in revenue for the UP Vertical Papua hospital, a scheme has been created to determine the Cost of Goods Sold (HPP) for the UPT Vertical Papua Hospital to gradually increase by the inflation value over its economic life, namely 5.75% per year.

After obtaining the size of *the Annual Power Sale* and the amount of increase in income, the annual revenue value is calculated as follows:

Formula used:

Nth year rate = 1st Year Rate x (1 + inflation) ^{n}

Referring to the calculations of the planning consultant team for the Papua Vertical UPT Hospital, it was found that the income projection results for year I of the Papua Vertical UPT

Hospital generated an income of Rp. 282,126,682,209,- so that if included in the potential revenue formula it is as follows:

282,126,682,209 x (1+5.75%) ^{2} = Rp. 315,504,032,006,-

Based on the calculation results above, the potential revenue can be seen in the following table:

Table 3
Potential annual revenue of UPT Vertical Hospital Papua

20th year	Potential revenue
1	IDR 282,126,682,209
2	IDR 315,504,032,006
3	IDR 333,645,513,846
4	IDR 352,830,130,893
5	IDR 373,117,863,419
6	IDR 394,572,140,566
7	IDR 417,260,038,648
8	IDR 441,252,490,870
9	IDR 466,624,509,095
10	IDR 493,455,418,368
11	IDR 521,829,104,925
12	IDR 551,834,278,458
13	IDR 583,564,749,469
14	IDR 617,119,722,563
15	IDR 652,604,106,611
16	IDR 690,128,842,741
17	IDR 729,811,251,199
18	IDR 771,775,398,142
19	IDR 816,152,483,536
20	IDR 863,081,251,339
21	IDR 912,708,423,291
22	IDR 965,189,157,630
23	IDR 1,020,687,534,194
24	IDR 1,079,377,067,410
25	IDR 1,141,441,248,786
26	IDR 1,207,074,120,591
27	IDR 1,276,480,882,525
28	IDR 1,349,878,533,271
29	IDR 1,427,496,548,934

30	IDR 1,509,577,600,497

Source: analysis results

Estimated cash outflow (cash outflow)

Operational and maintenance costs are estimates of costs incurred each year for the operation and maintenance of civil buildings and electro-mechanical equipment. The cost is assumed to be 0.5% of each civil work cost. Apart from annual costs, 5-year and 10-year O/M costs are also calculated (Deviany Kartika, 2010).

The estimated working capital *for* operations and *maintenance* of the Papua Vertical UPT Hospital in the first year is as follows:

Working Capital for 1 year = 0.5% x *Total Investment*
= 0.5% x Rp. 1,075,850,660,000,-
= Rp. 5,379,253,300,-

Estimated working capital, namely *O&M costs* in the first year, is 0.5% of the initial investment costs with a total cost of **Rp. 5,379,253,300 ,-**

The costs at the Papua Jayapura Vertical UPT Hospital consist of two types of costs, namely:

a. Fixed costs (*fixed O&M costs*) are costs that will always be incurred by the Papua Vertical UPT Hospital and the amount does not depend on the results of the services produced, such as employee salaries. The *fixed O&M costs* at the Papua Vertical UPT Hospital are assumed to be 70% of the total operational and maintenance costs each year.
b. Variable costs (variable O&M costs) are expenditure costs that will change according to service results. In this case, the Papua Vertical UPT Hospital is not yet operational. So the variable O&M costs at the Papua Vertical UPT Hospital are assumed to be 30% of the total operational and maintenance costs each year.

Operational and maintenance costs begin to be calculated in year I, which is when the Papua Vertical UPT Hospital project is planned to start operating. Meanwhile, the next step is to include the influence of inflation of 5.75% in order to *discount* the estimated value of *revenue* obtained in the future.

Calculation example:
Rp. 5,379,253,300 x 70% = Rp. 3,765,477,310,-
Rp. 5,379,253,300 x 30% = Rp. 1,613,775,990,-

Based on the calculation results above, it can be seen in the following table:

Table 4
***Annual O&M cost for* the Papua Vertical UPT Hospital project**

20th year	Annual O&M Cost	Fixed O&M Cost (70%)	Variable O&M Cost (30%)
1	IDR 5,379,253,300	IDR 3,765,477,310	IDR 1,613,775,990
2	IDR 6,015,652,586	IDR 4,210,956,810	IDR 1,804,695,776
3	IDR 6,361,552,609	IDR 4,453,086,827	IDR 1,908,465,783
4	IDR 6,727,341,884	IDR 4,709,139,319	IDR 2,018,202,565
5	IDR 7,114,164,043	IDR 4,979,914,830	IDR 2,134,249,213
6	IDR 7,523,228,475	IDR 5,266,259,933	IDR 2,256,968,543

7	IDR 7,955,814,113	IDR 5,569,069,879	IDR 2,386,744,234
8	IDR 8,413,273,424	IDR 5,889,291,397	IDR 2,523,982,027
9	IDR 8,897,036,646	IDR 6,227,925,652	IDR 2,669,110,994
10	IDR 9,408,616,253	IDR 6,586,031,377	IDR 2,822,584,876
11	IDR 9,949,611,688	IDR 6,964,728,181	IDR 2,984,883,506
12	IDR 10,521,714,360	IDR 7,365,200,052	IDR 3,156,514,308
13	IDR 11,126,712,935	IDR 7,788,699,055	IDR 3,338,013,881
14	IDR 11,766,498,929	IDR 8,236,549,250	IDR 3,529,949,679
15	IDR 12,443,072,618	IDR 8,710,150,832	IDR 3,732,921,785
16	IDR 13,158,549,293	IDR 9,210,984,505	IDR 3,947,564,788
17	IDR 13,915,165,877	IDR 9,740,616,114	IDR 4,174,549,763
18	IDR 14,715,287,915	IDR 10,300,701,541	IDR 4,414,586,375
19	IDR 15,561,416,971	IDR 10,892,991,879	IDR 4,668,425,091
20	IDR 16,456,198,446	IDR 11,519,338,912	IDR 4,936,859,534
21	IDR 17,402,429,857	IDR 12,181,700,900	IDR 5,220,728,957
22	IDR 18,403,069,574	IDR 12,882,148,702	IDR 5,520,920,872
23	IDR 19,461,246,074	IDR 13,622,872,252	IDR 5,838,373,822
24	IDR 20,580,267,724	IDR 14,406,187,406	IDR 6,174,080,317
25	IDR 21,763,633,118	IDR 15,234,543,182	IDR 6,529,089,935
26	IDR 23,015,042,022	IDR 16,110,529,415	IDR 6,904,512,607
27	IDR 24,338,406,938	IDR 17,036,884,857	IDR 7,301,522,081
28	IDR 25,737,865,337	IDR 18,016,505,736	IDR 7,721,359,601
29	IDR 27,217,792,594	IDR 19,052,454,816	IDR 8,165,337,778
30	IDR 28,782,815,668	IDR 20,147,970,968	IDR 8,634,844,700

Source: analysis results

From the results of the calculations above, it is obtained that operational and maintenance costs at the beginning of the operational year for the UPT Vertical Papua Hospital were Rp. 5,379,253,300 and is assumed to increase following the increase in inflation, namely 5.75% in the following years.

Depreciation (depreciation)

To obtain the depreciation value, the straight *line method is used.* The annual depreciation value on the Jayapura port apron can be calculated as follows:

$$\text{Depreciation} = \frac{\text{Cost of building the asset - Residual value of the asset}}{\text{The economic life of the asset}}$$

$$= \frac{\text{Rp. 1,075,850,660,000 – Rp. 0}}{\text{30 years}}$$

$$= \text{Rp. 35,861,688,667}$$

By starting from the time the construction period has been completed, depreciation is calculated starting from year 1 when the operational period begins. So, from the

calculation results it was found that the depreciation value of the Papua Vertical UPT Hospital project was IDR. 35,861,688,667,- per year during the economic life of the Papua Vertical UPT Hospital.

Tax

The tax calculated in this research is corporate income tax and is calculated at the beginning of the operational year, because in calculating the gross income (revenue *)* of the Papua Vertical UPT Hospital, the value is more than 50 billion, the tax calculation that must be paid to the government is equal to 25% of gross income each year, in accordance with the basic tax laws contained in Law no. 7 of 1983 concerning income tax, which was later amended by Law no. 36 of 2008 concerning the fourth amendment to Law no. 7 of 1983 concerning income tax, as well as Government Regulation no. 46 of 2013 concerning income tax on income from businesses received or obtained by taxpayers who have a certain gross turnover.

So the amount of tax that must be paid each year during the economic life of the Papua Vertical UPT Hospital can be seen as follows:

Formula used:

Tax = Revenue x 25%

Calculation example:

Rp. 282,126,682,209 x 25% = Rp. 70,531,670,552,-

Based on the example calculation results, the complete calculation can be seen in the following table:

Table 4
Tax amount per year

1st Operational Year	Gross Income	Taxes 25%
1	IDR 282,126,682,209	IDR 70,531,670,552
2	IDR 315,504,032,006	IDR 78,876,008,002
3	IDR 333,645,513,846	IDR 83,411,378,462
4	IDR 352,830,130,893	IDR 88,207,532,723
5	IDR 373,117,863,419	IDR 93,279,465,855
6	IDR 394,572,140,566	IDR 98,643,035,141
7	IDR 417,260,038,648	IDR 104,315,009,662
8	IDR 441,252,490,870	IDR 110,313,122,718
9	IDR 466,624,509,095	IDR 116,656,127,274
10	IDR 493,455,418,368	IDR 123,363,854,592
11	IDR 521,829,104,925	IDR 130,457,276,231
12	IDR 551,834,278,458	IDR 137,958,569,614
13	IDR 583,564,749,469	IDR 145,891,187,367
14	IDR 617,119,722,563	IDR 154,279,930,641
15	IDR 652,604,106,611	IDR 163,151,026,653
16	IDR 690,128,842,741	IDR 172,532,210,685

17	IDR 729,811,251,199	IDR 182,452,812,800
18	IDR 771,775,398,142	IDR 192,943,849,536
19	IDR 816,152,483,536	IDR 204,038,120,884
20	IDR 863,081,251,339	IDR 215,770,312,835
21	IDR 912,708,423,291	IDR 228,177,105,823
22	IDR 965,189,157,630	IDR 241,297,289,408
23	IDR 1,020,687,534,194	IDR 255,171,883,548
24	IDR 1,079,377,067,410	IDR 269,844,266,853
25	IDR 1,141,441,248,786	IDR 285,360,312,197
26	IDR 1,207,074,120,591	IDR 301,768,530,148
27	IDR 1,276,480,882,525	IDR 319,120,220,631
28	IDR 1,349,878,533,271	IDR 337,469,633,318
29	IDR 1,427,496,548,934	IDR 356,874,137,233
30	IDR 1,509,577,600,497	IDR 377,394,400,124

Source: analysis results

Cash Flow Analysis

Cash flow functions to see the cash inflow and cash outflow at the UPT Vertical Papua Hospital starting from the construction period until the operational period, so that it can provide an overview of the financial capacity of the UPT Vertical Papua Hospital each year, the formula used is as follows:

Formula: PV = $\frac{FV_n}{(1+i)^n} = FV_n \frac{1}{(1+i)^n}$

Where:

PV = *Present value/* current value
FV = *Future value/* later value
I = rate/interest rate
N = certain period/th year

Calculation example:

PV = Rp. 206,215,758,357 x (1/(1+5.75%))
= Rp. 195,003,081,188,-

For complete calculations, see the following table:

Table 5
Vertical UPT Hospital *cash flow*

20th year	Potential Revenue	Annual O&M Cost	Taxes 25%	Income	PVIncome
1	IDR 282,126,682,209	IDR 5,379,253,300	IDR 70,531,670,552	IDR 206,215,758,357	IDR 195,003,081,188
2	IDR 315,504,032,006	IDR 6,015,652,586	IDR 78,876,008,002	IDR 230,612,371,419	IDR 206,215,758,357
3	IDR 333,645,513,846	IDR 6,361,552,609	IDR 83,411,378,462	IDR 243,872,582,775	IDR 206,215,758,357

4	IDR 352,830,130,893	IDR 6,727,341,884	IDR 88,207,532,723	IDR 257,895,256,285	IDR 206,215,758,357
5	IDR 373,117,863,419	IDR 7,114,164,043	IDR 93,279,465,855	IDR 272,724,233,521	IDR 206,215,758,357
6	IDR 394,572,140,566	IDR 7,523,228,475	IDR 98,643,035,141	IDR 288,405,876,949	IDR 206,215,758,357
7	IDR 417,260,038,648	IDR 7,955,814,113	IDR 104,315,009,662	IDR 304,989,214,873	IDR 206,215,758,357
8	IDR 441,252,490,870	IDR 8,413,273,424	IDR 110,313,122,718	IDR 322,526,094,729	IDR 206,215,758,357
9	IDR 466,624,509,095	IDR 8,897,036,646	IDR 116,656,127,274	IDR 341,071,345,176	IDR 206,215,758,357
10	IDR 493,455,418,368	IDR 9,408,616,253	IDR 123,363,854,592	IDR 360,682,947,523	IDR 206,215,758,357
11	IDR 521,829,104,925	IDR 9,949,611,688	IDR 130,457,276,231	IDR 381,422,217,006	IDR 206,215,758,357
12	IDR 551,834,278,458	IDR 10,521,714,360	IDR 137,958,569,614	IDR 403,353,994,484	IDR 206,215,758,357
13	IDR 583,564,749,469	IDR 11,126,712,935	IDR 145,891,187,367	IDR 426,546,849,166	IDR 206,215,758,357
14	IDR 617,119,722,563	IDR 11,766,498,929	IDR 154,279,930,641	IDR 451,073,292,993	IDR 206,215,758,357
15	IDR 652,604,106,611	IDR 12,443,072,618	IDR 163,151,026,653	IDR 477,010,007,341	IDR 206,215,758,357
16	IDR 690,128,842,741	IDR 13,158,549,293	IDR 172,532,210,685	IDR 504,438,082,763	IDR 206,215,758,357
17	IDR 729,811,251,199	IDR 13,915,165,877	IDR 182,452,812,800	IDR 533,443,272,522	IDR 206,215,758,357
18	IDR 771,775,398,142	IDR 14,715,287,915	IDR 192,943,849,536	IDR 564,116,260,691	IDR 206,215,758,357
19	IDR 816,152,483,536	IDR 15,561,416,971	IDR 204,038,120,884	IDR 596,552,945,681	IDR 206,215,758,357

20	IDR 863,081,251,339	IDR 16,456,198,446	IDR 215,770,312,835	IDR 630,854,740,058	IDR 206,215,758,357
21	IDR 912,708,423,291	IDR 17,402,429,857	IDR 228,177,105,823	IDR 667,128,887,611	IDR 206,215,758,357
22	IDR 965,189,157,630	IDR 18,403,069,574	IDR 241,297,289,408	IDR 705,488,798,649	IDR 206,215,758,357
23	IDR 1,020,687,534,194	IDR 19,461,246,074	IDR 255,171,883,548	IDR 746,054,404,571	IDR 206,215,758,357
24	IDR 1,079,377,067,410	IDR 20,580,267,724	IDR 269,844,266,853	IDR 788,952,532,834	IDR 206,215,758,357
25	IDR 1,141,441,248,786	IDR 21,763,633,118	IDR 285,360,312,197	IDR 834,317,303,472	IDR 206,215,758,357
26	IDR 1,207,074,120,591	IDR 23,015,042,022	IDR 301,768,530,148	IDR 882,290,548,422	IDR 206,215,758,357
27	IDR 1,276,480,882,525	IDR 24,338,406,938	IDR 319,120,220,631	IDR 933,022,254,956	IDR 206,215,758,357
28	IDR 1,349,878,533,271	IDR 25,737,865,337	IDR 337,469,633,318	IDR 986,671,034,616	IDR 206,215,758,357
29	IDR 1,427,496,548,934	IDR 27,217,792,594	IDR 356,874,137,233	IDR 1,043,404,619,106	IDR 206,215,758,357
30	IDR 1,509,577,600,497	IDR 28,782,815,668	IDR 377,394,400,124	IDR 1,103,400,384,705	IDR 206,215,758,357
				∑ PV Income	IDR 5,144,181,281,750

Income obtained at the beginning of the year was **IDR. 195,003,081,188,-** and is assumed to increase in subsequent years following inflation of 5.75%.

Financial Feasibility of the Papua Vertical UPT Hospital Project

the cash flow analysis of the Papua Vertical UPT Hospital project, in analyzing financial feasibility, present value is sought *to* be able to calculate the time *value of money* in the cash flows that have been analyzed. In data analysis, data is obtained

Outlay PV = Rp. 1,075,850,660,000,-

∑ PV *income* = Rp. 1,509,577,600,497,-

Furthermore, in more detail, in determining the financial feasibility of the Papua

Vertical UPT Hospital project, the investment assessment criteria method was used, namely *Net Present Value* (NPV), *Benefit Cost Ratio* (BCR), *Internal Rate Return* (IRR) and *Break Even Point* (BEP).

***Net Present Value* (NPV)**

The assessment criteria for the NPV method are that if the calculation result is positive then the investment is considered feasible, but if the opposite result is negative then the investment is considered not feasible.

So the NPV value for the Papua Vertical UPT Hospital project can be calculated as follows:

NPV = ∑ PV *income* - PV *outlay*
= Rp. 1,509,577,600,497 - Rp. 1,075,850,660,000
= Rp. 433,726,940,497 (positive)

From the calculation results, the NPV value for the Papua Vertical UPT Hospital project is positive, so it can be concluded that the project is **feasible.**

Benefit Cost Ratio (BCR)

The assessment criteria for the BCR method are that a project is declared feasible if the BCR value is greater than or equal to 1 or BCR > 1, and declared unfeasible if the BCR value is less than 1.

The BCR value of the Papua Vertical UPT Hospital can be calculated as follows:

BCR = ∑ PV *income* / PV *outlay*
= Rp. 1,509,577,600,497 / Rp. 1,075,850,660,000
= 1.40

A BCR value greater than 1 in the Papua Vertical UPT Hospital project indicates that the benefits are greater than the costs *incurred* , so it can be concluded that the project **is feasible**

Internal Rate Return (IRR)

The assessment criteria for the IRR method is that if the IRR value is greater than the specified interest rate, then the investment is feasible. If, on the other hand, the IRR value is smaller than the interest rate, then the investment is not feasible.

By using the *trial and error method,* the NPV for different interest rates is as shown in the following table:

Table 6
***Trial and error* IRR**

Year	PVIncome	PV income/(1+r)^n (+)	PV income/(1+r)^n (-)
1	IDR 195,003,081,188	IDR 165,256,848,465	IDR 163,868,135,452
2	IDR 206,215,758,357	IDR 148,100,946,823	IDR 145,622,313,648
3	IDR 206,215,758,357	IDR 125,509,276,969	IDR 122,371,692,141
4	IDR 206,215,758,357	IDR 106,363,794,041	IDR 102,833,354,740
5	IDR 206,215,758,357	IDR 90,138,808,510	IDR 86,414,583,815
6	IDR 206,215,758,357	IDR 76,388,820,771	IDR 72,617,297,324
7	IDR 206,215,758,357	IDR 64,736,288,789	IDR 61,022,938,928
8	IDR 206,215,758,357	IDR 54,861,261,686	IDR 51,279,780,611

9	IDR 206,215,758,357	IDR 46,492,594,649	IDR 43,092,252,615
10	IDR 206,215,758,357	IDR 39,400,503,940	IDR 36,211,976,987
11	IDR 206,215,758,357	IDR 33,390,257,576	IDR 30,430,232,762
12	IDR 206,215,758,357	IDR 28,296,828,454	IDR 25,571,624,170
13	IDR 206,215,758,357	IDR 23,980,363,097	IDR 21,488,759,807
14	IDR 206,215,758,357	IDR 20,322,341,607	IDR 18,057,781,350
15	IDR 206,215,758,357	IDR 17,222,323,396	IDR 15,174,606,177
16	IDR 206,215,758,357	IDR 14,595,189,319	IDR 12,751,769,896
17	IDR 206,215,758,357	IDR 12,368,804,507	IDR 10,715,773,022
18	IDR 206,215,758,357	IDR 10,482,037,718	IDR 9,004,851,279
19	IDR 206,215,758,357	IDR 8,883,082,812	IDR 7,567,101,915
20	IDR 206,215,758,357	IDR 7,528,036,281	IDR 6,358,909,172
21	IDR 206,215,758,357	IDR 6,379,691,764	IDR 5,343,621,153
22	IDR 206,215,758,357	IDR 5,406,518,444	IDR 4,490,437,944
23	IDR 206,215,758,357	IDR 4,581,795,291	IDR 3,773,477,264
24	IDR 206,215,758,357	IDR 3,882,877,366	IDR 3,170,989,297
25	IDR 206,215,758,357	IDR 3,290,574,039	IDR 2,664,696,889
26	IDR 206,215,758,357	IDR 2,788,622,067	IDR 2,239,241,083
27	IDR 206,215,758,357	IDR 2,363,239,040	IDR 1,881,715,196
28	IDR 206,215,758,357	IDR 2,002,744,949	IDR 1,581,273,274
29	IDR 206,215,758,357	IDR 1,697,241,482	IDR 1,328,801,070
30	IDR 206,215,758,357	IDR 1,438,340,239	IDR 1,116,639,555
	Σ	IDR 1,128,150,054,090	IDR 1,070,046,628,537

Source: analysis results

By *trial and error,* value is obtained
NPV1 = Rp. 52,299,394,090 (Positive)
NPV2 = Rp. 5,804,031,463(Negative)
i1 = 18 %
i2 = 19%
So that,

$$IRR = i1 + \frac{NPV1}{NPV1 - NP}\,(i2 - i1)$$

IRR = 19%
This IRR value is higher than the specified interest rate, namely 10%, so it can be concluded that the project **is feasible.**

***Payback Period* (PP)**

Payback Period method functions to calculate how quickly it takes a project to return the investment and working capital invested. PP is obtained by dividing capital costs by income *(revenue)* per year. The assessment criteria for the *Payback Period method* is if PP

faster than the required time (in this research, namely the economic life of the asset), then the investment is feasible. If otherwise, PP is obtained longer than the economic life of the asset, then the investment is not feasible.

The PP value for the Vertical UPT Hospital project can be calculated as follows:

Table 7
***Return* and *balance* calculation**

No	Year	Return	Balance
1	0	-Rp 1,075,850,660,000.00	-Rp 1,075,850,660,000.00
2	1	IDR 195,003,081,188.42	-Rp 880,847,578,811.58
3	2	IDR 206,215,758,356.75	-Rp 674,631,820,454.83
4	3	IDR 206,215,758,356.75	-Rp 468,416,062,098.08
5	4	IDR 206,215,758,356.75	-Rp 262,200,303,741.33
6	5	IDR 206,215,758,356.75	-Rp 55,984,545,384.58
7	6	IDR 206,215,758,356.75	IDR 150,231,212,972.17
8	7	IDR 206,215,758,356.75	IDR 356,446,971,328.92
9	8	IDR 206,215,758,356.75	IDR 562,662,729,685.67
10	9	IDR 206,215,758,356.75	IDR 768,878,488,042.42
11	10	IDR 206,215,758,356.75	IDR 975,094,246,399.17
12	11	IDR 206,215,758,356.75	IDR 1,181,310,004,755.92
13	12	IDR 206,215,758,356.75	IDR 1,387,525,763,112.67
14	13	IDR 206,215,758,356.75	IDR 1,593,741,521,469.42
15	14	IDR 206,215,758,356.75	IDR 1,799,957,279,826.17
16	15	IDR 206,215,758,356.75	IDR 2,006,173,038,182.92
17	16	IDR 206,215,758,356.75	IDR 2,212,388,796,539.67
18	17	IDR 206,215,758,356.75	IDR 2,418,604,554,896.42
19	18	IDR 206,215,758,356.75	IDR 2,624,820,313,253.17
20	19	IDR 206,215,758,356.75	IDR 2,831,036,071,609.92
21	20	IDR 206,215,758,356.75	IDR 3,037,251,829,966.67
22	21	IDR 206,215,758,356.75	IDR 3,243,467,588,323.42
23	22	IDR 206,215,758,356.75	IDR 3,449,683,346,680.17
24	23	IDR 206,215,758,356.75	IDR 3,655,899,105,036.92
25	24	IDR 206,215,758,356.75	IDR 3,862,114,863,393.67
26	25	IDR 206,215,758,356.75	IDR 4,068,330,621,750.42
27	26	IDR 206,215,758,356.75	IDR 4,274,546,380,107.17
28	27	IDR 206,215,758,356.75	IDR 4,480,762,138,463.92

29	28	IDR 206,215,758,356.75	IDR 4,686,977,896,820.67
30	29	IDR 206,215,758,356.75	IDR 4,893,193,655,177.42
31	30	IDR 206,215,758,356.75	IDR 5,099,409,413,534.17

From the table above, *the Payback Period* (PP) of the Vertical UPT Hospital in Papua

$$PP = 5 + \frac{0 - (-55{,}984.545.384.58)}{150{,}231{,}212{,}972.17 - (-55{,}984.545.384.58)} \times (6-5)$$

$$= 5.3$$

So, *the Payback Period* (PP) is obtained in year 5.3, so it can be confirmed that the project is **feasible** to implement because the PP results are faster than the economic life of the asset.

Sensitivity analysis

In this analysis, to get the influence of the changes that will occur, the following conditions are taken into account:

1. When conditions are normal, the conditions are in accordance with the analytical calculations above.
2. There are fixed project costs and the estimated benefit value will decrease by 10%.
3. There was an increase in project costs of 10% and the benefit value remained constant

So the calculation can be seen in the following table:

Table 8
Sensitivity analysis of the Papua Vertical UPT Hospital project

No	Circumstances	Method			
		NPV	**BCR**	**IRR**	**PP**
1	Normal condition	Rp. 433,726,940,497 (positive/eligible)	1.06 > 1 (decent)	19% > 10% (feasible)	5.3 years < 30 years (eligible)
2	Fixed benefit costs decreased by 10%	Rp. 282,769,180,448 (positive/eligible)	1.26 > 1 (decent)	17% > 10% (feasible)	5.9 years < 30 years (eligible)
3	Costs increase by 10% fixed benefits	Rp. 326,141,874,497 (positive/eligible)	1.28 > 1 (decent)	17% > 10% (feasible)	5.8 years < 30 years (eligible)

Source: analysis results

Social Benefits

Based on the sensitivity analysis, the four methods used by the Vertical UPT Hospital project are feasible to implement. Apart from being financially feasible, the Vertical UPT Hospital project also has social *benefits* , namely:

1. Based on the 5 (five) work priorities of the President of the Republic of Indonesia 2019-2024 in point 2 (two), it is stated that "Human Resource (HR) development includes ensuring the health of pregnant women and school age children, improving the quality of education and talent management" with development plans Papua Vertical UPT Hospital becomes a Class A Hospital then:
   a. will facilitate access for the community, especially Eastern Indonesia, to obtain better services and fulfillment of health facilities and medical and non-medical equipment.
   b. As a forum for developing research for medical students at Cenderawasih University which focuses on tropical medicine with superior services, namely cancer, heart, stroke and uronefrost.
   c. As a forum for training and development of human resources in the health sector in an integrated manner.
2. Based on the Human Development Index (HDI), which states that residents can access development results in obtaining income, health, education and so on, with the construction of this Vertical UPT Hospital, then:
   a. The recruitment of local health and non-health workers can be ensured that the human resources meet the standard qualifications in their fields. It is planned that recruitment at the start of the hospital operation will require 543 people and in the development towards the Class A Vertical UPT Hospital, 757 people will be needed.
   b. With adequate facilities and complete medical personnel, the UPT Vertical Papua Hospital can become a referral hospital for all hospitals in Jayapura City and its surroundings.
   c. The large area of the UPT Vertical Papua Hospital can be used as a business area for the surrounding community, such as managing a canteen or restaurant, of course with permission from the hospital management.

CONCLUSION

The results of the financial feasibility analysis of the UPT Vertical Papua hospital building project revealed several important findings. First, the total cost required to build this project reaches Rp. 1,075,850,660,000,-. Second, the project is proven to be financially feasible using several evaluation methods. The NPV (Net Present Value) method produces a positive value of Rp. 433,726,940,497, indicating that this project is profitable. In addition, the BCR (Benefit Cost Ratio) value exceeds 1, namely 1.06, which shows the financial benefits of this investment. Lastly, the IRR (Internal Rate Return) method provides an internal rate of return of 19%. Third, this project also has a fairly fast rate of return with a payback period (PP) of only 5.3 years, which is shorter than the economic life set at 30 years. Thus, the results of the financial feasibility analysis conclude that the Papua Vertical UPT Hospital construction project is financially feasible and profitable.

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