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INVESTMENT ANALYSIS OF NEW INPATIENT WARDS PROJECT AT ULIN HOSPITAL OF BANJARMASIN

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Abstract-*Adequate health care in a province is one of the primary needs that cannot be neglected. These needs will affect the health and life expectancy of the population of the province. Hospital is one of the health facilities provided by the government or private, in which there are many types of health services one of which is the inpatient ward. The research for this thesis conducted at new inpatient wards project of BLUD Ulin hospital in Banjarmasin. At this time, RS Ulin has ten class inpatient services with a total capacity of 520 beds. The main focus of this thesis is to conduct an investment analysis on new inpatient wards which claimed a total investment cost of Rp. 39,781,562,180. Investment valuation method used is Net Present Value (NPV), Internal Rate of Return (IRR) and payback period (PBP). Alternative funding of this project is 100% through APBD or 60% debt of investment cost. From the analysis it was found that the value of the project by fully APBD funding alternative budget has a greater NPV and IRR and PBP faster the NPV is Rp 28,496,595,592; IRR 14.67%; simple PBP 7 years 5 months; discounted PBP 10 years 5 months while that for second alternative funding the NPV is Rp (1,504,304,542); IRR of 9.15%. The scenarios analysis are set to five scenarios, which are very pessimistic, pessimistic, mostly-like, optimistic, and very optimistic with their respective optimal occupancy rate 56%, 63%, 70%, 77%, and 84%. Under the very pessimistic scenario the project has NPV Rp 10,899,289,212; IRR 11.06%; simple PBP 8 years 2 months; PBP discounted 12 years 7 months*

Keyword: Hospital, inpatient, BOR, NPV, IRR, PBP

1. Introduction

Health is one of the basic human needs which are very important, this need will continue to increase as the growth of economic conditions and public health degree. This condition will lead to increased demand for availability of health care service providers. Hospital services as one unit of health care providers have an important role in the implementation of quality and adequate health care. In the U.U. No. 44 of 2009 mentioned that hospital is a health care institution which conducts complete individual health care that provides inpatient, outpatient, and emergency services. Hospital has simultaneous tasks, namely implementation of quality health care with emphasis on healing and recovery efforts undertaken simultaneously with efforts of public health improvement, disease prevention and treatment of disease.

The hospital became the primary node that serves as a referral center in the networking of health services. Managing a hospital is a challenging task and should always give priority to excellent service to patients. As a service industry, hospitals have social functions and economic functions. Where social function is to provide health services to all levels of society and its economic function is as a business unit within the health field who have the right to charge for services rendered. Since from 2005, bed capacity of Ulin hospital has increased as a form of the hospital's commitment to providing adequate health care to the community. Until the year 2011 the inpatients wards of Ulin hospital had total bed capacity of as many as 520, in Table 1.2 can be seen the development of the capacity of the hospital inpatient wards Ulin from 2005 to 2011. Escalation in bed capacity of inpatients wards had

received a positive response from the community, it is shown by the increasing number of patient visits every year as a whole.

Table. 1.1 Number of Patient Visits Period 2005 – 2011

No.	Class	2005	2006	2007	2008	2009	2010	2011
1	VVIP-A	317	368	400	443	886	806	941
2	VVIP-B	242	287	312	339	399	580	565
3	VVIP-C	520	586	637	792	747	722	832
4	VVIP-D	687	766	833	984	978	1186	1234
5	VIP-A	285	333	362	389	394	269	352
6	VIP-B	830	893	1025	1139	1461	1550	1691
7	VIP-C	896	964	1102	1181	1510	1210	1473
8	Class I	1074	1155	1310	1410	2394	3568	3445
9	Class II	3992	4293	4666	4779	5286	6162	6256
10	Class III	10056	10813	11753	12566	11329	13329	13514
Total		18900	20458	22400	24022	25384	29382	30303

Table 1.2 Beds Capacity Period of 2005-2011

Class	Beds Capacity													
	2005		2006		2007		2008		2009		2010		2011	
	Beds	%	Beds	%	Beds	%	Beds	%	Beds	%	Beds	%	Beds	%
VVIP-A	11	5.00	11	2.93	11	2.75	11	2.62	16	3.56	16	3.08	16	3.08
VVIP-B	10	4.55	10	2.67	10	2.50	10	2.38	10	2.22	10	1.92	10	1.92
VVIP-C	11	5.00	11	2.93	11	2.75	11	2.62	11	2.44	11	2.12	11	2.12
VVIP-D	10	4.55	10	2.67	10	2.50	10	2.38	18	4.00	18	3.46	18	3.46
VIP-A	4	1.82	4	1.07	4	1.00	4	0.95	4	0.89	4	0.77	4	0.77
VIP-B	15	6.82	15	4.00	15	3.75	15	3.57	20	4.44	20	3.85	20	3.85
VIP-C	14	6.36	14	3.73	14	3.50	14	3.33	21	4.67	21	4.04	21	4.04
Class I	20	9.09	45	12.00	55	13.75	65	15.48	65	14.44	82	15.77	82	15.77
Class II	25	11.36	55	14.67	60	15.00	70	16.67	70	15.56	93	17.88	93	17.88
Class III	100	45.45	200	53.33	210	52.50	210	50.00	215	47.78	245	47.12	245	47.12
Total	220	100	375	100	400	100	420	100	450	100	520	100	520	100

The increase in the number of visits shows that the demand for inpatient services is still quite potential and it is an opportunity for the hospital to do development on inpatient services owned. In the table 1.4 is shown the number of patient visits in inpatient wards from year 2005 to 2011. Banjarmasin as the capital of South Borneo province which is the center of government and economy activity could not be separated from the demand for medical care for the people living in it.

Health services for the community will continue to grow along with population growth of Banjarmasin city, the demands for improved quality and quantity of health services was unavoidable. It results in Ulin hospital of Banjarmasin which is a level III referral hospital in the area of South Borneo, Central Borneo and East Borneo to continuously improve the quality and quantity of its services.

The improvement of health services could be achieved with the development of the hospital through additional inpatient wards. This hospital's plan to invest in additional inpatient wards is a long-term investment plan that requires analysis of its financial aspects. The goal is to determine the feasibility of implementation of investment and to gain insight about the value of the investment would be rewarding or not.

2. Business Issue Exploration

In this investment analysis will be discussed on the aspects that will influence the investment decisions. Among these are the aspects of market opportunities, technical aspects, and social, cultural, legal, regulatory and financial aspects analysis. The focus in this study will lead to aspects of financial analysis, which will be discussed in more detail about the calculation of indicators of investment projects such as NPV, IRR, PBP. They will also be carried out sensitivity analysis of project value to the unit variables such as inpatients tariff and hospital operating expenses.

A. Conceptual Framework

To better understand the investment analysis of new inpatient wards, this study used a conceptual framework shown in figure 1

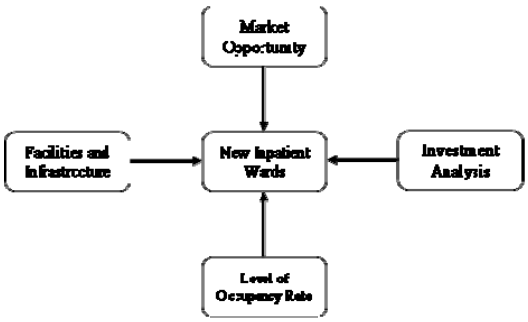

Figure 1. Conceptual Framework

B. Issues Data Collection

The scope of this study is the investment analysis of new inpatient wards project at Ulin hospital of Banjarmasin. This study is started by conducting literature study and collecting facts about hospital industry condition in Banjarmasin to describe the market opportunity, followed by collecting secondary data from the hospital. The secondary data consist of inpatient indicators such as bed occupancy ratio, patients' visit, and also the population data of Banjarmasin. The project data also collected to conduct the investment analysis. The data collection was done through collecting the related document. The objective of analysis is to determine the feasibility of investment implementation and to gain insight about the value of the investment would be rewarding or not in the future.

C. Analysis of Business Situation

To see the market opportunity inside the hospital industry could be seen from the forecasted hospital inpatient visits each year. Based on patient visits data of inpatient wards for period of 2005-2011 years, forecasted patient visits by using double exponential smoothing (Holt) method is shown in figure 2

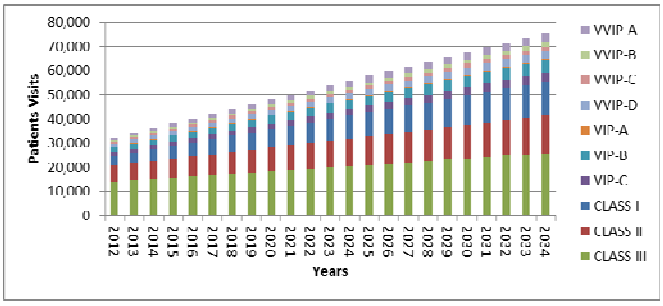

Figure 2. Estimation of Inpatient Patient Visits for period 2012-2034

It is also necessary to look at the indicators of occupancy rate of bed-owned by the hospital. Bed occupancy rate (BOR) of hospital is an indicator that states in the percentage of use of bed utilization

rate in units of time (Institute for Health Policy, 2007), in this study would be used the assumption of one-year time period (365 days). The percentage is obtained from the ratio of the number of day care available hospital bed days, as in the following equation:

$$Bed\ Occupancy\ Rate\ (BOR) = \frac{Hospital\ Bed\ Days\ of\ Care}{365\ X\ Bed\ Capacity}$$

Data from Ulin general hospital for year 2011, the number of day care for all classes is 181,449 patient-days, so with bed capacity of 520 units could be calculated the BOR for 0.956 or 95.6%. Level of hospital patients' visits will also be influenced by the number of population in an area. It is therefore necessary to estimate the population in the future. Data from the central statistical agency (BPS) of Banjarmasin on the results of the urban population census in 2010 showed the city had a population growth rate of 1.72% per year. With a population of 625,395 in 2010, can be estimated population of the city of Banjarmasin year period 2012-2034 in figure 3.

According to the ministry of health (1998), inpatient room is the space for inpatient care of patients who have to be treated more than 24 hours and requires an intensive health care both in terms of treatment, service, in accordance with the conditions of patients using the facilities of the hospital Inpatient hospital rooms can be grouped into several classes: a). VIP, with area ±21.5m^2/bed; b). Class I, facility for 2 people, with area ±15m^2/bed; c). Class II, facility for 3 people, with area ±10m^2/bed. New inpatient wards building specifications for the is shown in the table 1.3.

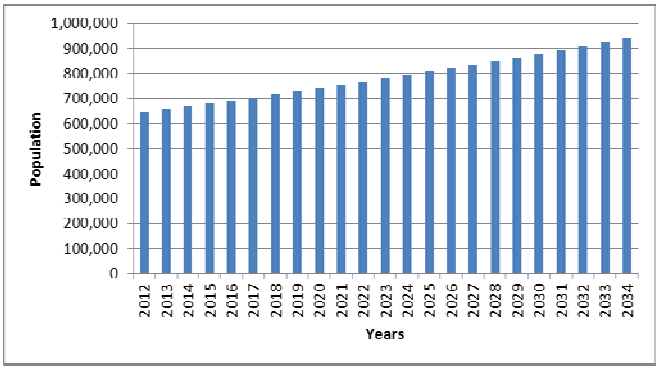

Figure 3. Estimation of Population in Banjarmasin Period 2012-2034

Table 1.3. Building Specifications

No.	Class	Storey	Building	Beds	Area (m^2)
1	VVIP (A,D), VIP (B,C)	3	1	130	2965
2	Class I	3	1	80	1400
3	Class II	2	1	90	1300
Total				300	5665

Hospital industry is very complex and technology-intensive, especially health technology/medical. Epidemiology of disease progression should be followed by the development of medical technologies/medicine for treatment, for diagnosis and therapy. Hospitals should keep abreast of medical technology/medicines are growing so rapidly. Medical equipment/medicine such advanced; CT.Scan, ultrasound, and MRI have become a thing should exist in every hospital. The existence of sophisticated medical equipment and medicine are expected to provide high quality services and satisfying customer/user community.

In the socio-cultural point of view, this project will have a positive impact on society and the city of Banjarmasin South Borneo province. Where additional inpatient capacity in accordance with the need for ensuring availability of health services for the community and will assist efforts to improve community health status. In addition the project also does not require new land acquisition from the surrounding community, but still use the land that already held by the hospital. So it will not show the potential socio-cultural friction due to land disputes with the surrounding community.

3. Business Solution

A. Alternative Business Solution

The project has two alternative sources of funding, first with 100% financing by hospital's fund, second involving a loan from Bank of South Kalimantan (BANK KALSEL) by 60% portion of the initial investment cost with interest rate 10.53% pa, repayment period 10 years and grace period 24 months. Discount factor used is the WACC with component cost of equity and cost of debt in it, the cost of equity used is 8 % which derived from the rate of deposit 5.5% pa (BANK KALSEL) plus 2.5% safety factor of increasing deposit rate in the future, while the cost of debt used is 10.53% pa. In the table below is shown the WACC for each alternative sources of funding:

Table 1.4 Discount factor

Alternative	Debt	Equity	WACC
1	0%	100%	8.00%
2	60%	40%	9.52%

With alternative sources of funding available, then to choose the best alternative for the project, the investment criteria calculation will be conducted and choose the largest Net Present Value, Internal Rate of Return, and the shortest Pay Back Period.

Table 1.5 Alternative Source of Funding Calculation Result

Alternative	NPV (IDR)	IRR (%)	PBP Discounted		PBP Simple	
			Years	Months	Years	Months
1	28,496,595,592	14.67%	10	5	7	5
2	(1,504,304,542)	9.15%	-	-	11	2

From the table 1.5 is shown that alternative of using 100% APBD has greater value of NPV and IRR with fastest Pay Back Period.

B. Analysis of Business Solution

The occupancy rate has an important role in the business activities of the inpatient wards because that is where the source of income of this unit. High occupancy will provide high revenue for the hospital, and vice versa. Therefore, sensitivity analysis was undertaken to determine the impact of the variation in the occupancy rate of the value of this project. In the previous discussion has been done calculating NPV and IRR at optimal occupancy rate of 70%, the value will be used as the mean with varying occupancy levels to two levels above and two levels down intervals respectively 10%, which are 56%, 63 %, 77%, and 84%. The results of the calculations can be seen in the table 1.6.Table 1.6 NPV And IRR of Various BOR

No	Scenario	BOR (%)	NPV (IDR)	IRR (%)	PBP Simple		PBP Discounted	
					Years	Months	Years	Months
1	Very Optimistic	84	42,263,531,191	16.80%	6	11	9	2
2	Optimistic	77	35,897,371,115	15.86%	7	2	9	7
3	Mostly Like	70	28,496,595,592	14.67%	7	5	10	5
4	Pessimistic	63	20,153,305,611	13.11%	7	8	10	11
5	Very Pessimistic	56	10,899,289,212	11.06%	8	2	12	7

There are made five scenarios, very pessimistic, pessimistic, mostly-like, pessimistic and very pessimistic as shown in table 1.6. From the table above it can be seen that the very pessimistic scenario of the lowest occupancy rate of 56% the NPV is still in positive figure, the project NPV Rp. 10,899,289,212 with IRR 11.06% which is greater than the value of the discount factor used 8%. This suggests that in the future in the event the conditions of low occupancy rate at 56%, the project was still able to give a positive value for the hospital Ulin so financially feasible to do.

From the table above it can be seen that in the pessimistic condition the NPV of the project is still in positive figure. The decrease in occupancy rate greatly affects the value of this project, which will decrease the value of the project. The low occupancy rate could be caused by several factors, such as lack of service quality, poor facilities, and inappropriate correlation between service tariff with service and facilities quality. Therefore, the hospital have to maintain its service and facilities quality in excellence level so people would be attracted to use its services.

Inpatient wards tariff adjustment is the step that possibly to be done by the management of the hospital in order to deal with very pessimistic scenario in the future. In the tariff adjustment, the hospital must also consider the economy characteristic of each inpatient wards class customer.

Tariff adjustment to increase the tariff of class 1 and class 2 though will provide greater income for the hospital, but it will be contrary to the social function of this government hospital. Increasing the tariff of class 1 and class 2 would reduce the health services access for people who are in middle-low economy level. Therefore, to avoid conflict with the social function, the hospital has an alternative to make the tariff adjustments for class VVIP and VIP which is provided for the people who could afford the tariff who are the middle-up economic class society.

4. Conclusion and Implementation Plan

Based on the preceding analysis, the inpatient ward project is feasible to run in the future. Under the most-likely scenario, this project has NPV Rp. 28,496,595,592 and IRR 14.67% and has a pay-back period of 10 years and 5 months for discounted PBP and 7 years and 5 months for PBP simple. The variation of bed occupancy rate has significant effect to the project NPV and IRR, as simulated before. At lowest rate of 56% with WACC 8%, the project NPV is Rp. 10,899,289,212 with IRR 11.06%. These amount shows that, the project is feasible to be conducted.

Although there are several factor that could cause low level of occupancy rate, such as:

1. Poor service quality
2. Poor facilities quality
3. Inappropriate correlation between service tariff and its quality

The implementation plan of this project is described into several stages, which are:

1. Construction

   At this stage the activities carried out are:

   1) Civil work which are piling process, establishing the foundations and structure of the building

2) Installation of mechanical / electrical which are electricity network, fire protection systems, lightning protection systems, medical gas systems and medical vacuum, ventilation systems, sanitation systems, lighting systems, and air conditioning systems.

2. Procurement
   At this stage, the activities carried out are procurement of medical equipment and supporting facilities of inpatient wards by each class requirement.
3. Recruitment
   The number of additional manpower required by this project is 100 nurses and 10 physicians. Criteria required for nurse education is graduate nursing diploma (D3), while for physicians is medical bachelor graduates (S1).
   Recruitment stage itself held for 10 months by targeting prospective nurses from several colleges of nursing and health sciences academy in Banjarmasin. And also will targeting prospective physicians from university of Lambung Mangkurat Banjarmasin. But it isn't limited for local graduates only, prospective candidates from outside the province also will be considered since Ulin hospital of Banjarmasin has established cooperation with health educational institutions outside the province
4. Function and Safety Check
   At this stage the activity carried out checks the operational functions of equipment and facilities of inpatient wards. In addition to this activity also conducted safety checks of the building. Checks carried out by the hospital along with the contractors who worked on the project.
5. Handover
   This stage is the final stage, the handover from the contractor to the hospital after assured overall operational functions of equipment and facilities of the new inpatient ward unit functioning properly and the safety of the building has been declared eligible to operate.

The inpatient wards project of Ulin hospital of Banjarmasin has positive impacts to the hospital itself and to the people of South Kalimantan province. For the hospital, the benefit is increased source of income derived from inpatient services. For the people, the benefit is an increase in health care facilities that will allow people to choose health care services in accordance with their economic level.

Recommendations for the hospital in order to face the very pessimistic scenario are:

1. Adding the health services partnership with Insurance Corporation
2. Tariff adjustments in inpatient wards class VVIP and VIP
3. Maintaining levels of health care quality services in the all inpatient class in order to prevent the shift of customers to other hospitals

Exhibit 1 Timeline

ACTIVITIES	MONTHS	1	2	3	4	5	6	7	8	9	10	11	12
Construction	10												
Procurement	8												
Recruitment	10												
Function and Safety Check	2												
Handover	1												

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