
Analysis of Activity Based Costing Method as the Basis Determination of Hospital Services Rates

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Abstract

The aim of this study is to get the accuracy of determining hospital rates. This study, which is Hospital X at the city of Batam, Indonesia uses a comparative descriptive analysis method with qualitative and quantitative approaches. Cost Drivers used in this study as a cost grouping are the number of inpatient days, the number of inpatients, and floor area. The results of inpatient service calculation based on the activity based costing system at the Hospital obtained a difference for the VIP class of IDR 459,646.68 and a difference for the class I of IDR 213,252.30 where the rate set by the Hospital was higher than it should be (over value). While the difference for class II is IDR 169.50 and the difference for class III is IDR 74,088.22 where the rate set by the hospital is lower than it should be (under value).

Keywords: Hospital, ABC Method, Rate, Cost.

I. INTRODUCTION

In profit-oriented organizations, sales are the main source of profit making by pressing the total costs incurred. In presenting health services, hospitals will receive income from the services and facilities offered, one of which is inpatient services. Accuracy in determining hospital rates is one of the important factors, especially in the rates of inpatient services because it will have an impact on the sustainability of hospitals, as well as assessment and consumer confidence. Due to the fierce competition, several hospitals set rates for inpatient services based on observations of other hospitals without calculating the costs incurred. There are also hospitals that use traditional accounting methods to determine their inpatient services rates by calculating the cost of salaries, electricity and water, consumption, and building depreciation only. Determination of such tariffs will cause cost distortions because the products produced do not reflect the costs absorbed as a whole. The distortion can cause undercoat and overcoat of the product. In addition, it can affect the profitability of hospitals.[1]

II. LITERATURE REVIEW

A. Cost accounting

Cost accounting measures, analyzes, and reports financial and financial information related to the cost of acquiring or using resources in an organization [2]. Cost Classification: Production Cost, Variable Cost, Fixed Cost, Direct Cost, Indirect Cost, Differentiation Cost, Opportunity cost and Sunk cost

B. Traditional Accounting Methods

Risk is the core issue of an enterprise's foreign investment. Compared with economic risk, non-economic risk is not only harmful, but also more difficult to predict and prevent, especially for developing country companies that lack comparative advantages. Institutional theory holds that the good institutional quality of the host country can effectively reduce the external uncertainty of foreign companies, reduce transaction costs and risks, and is an important factor in attracting foreign investment (Busse and Hefeker, 2007). But the interesting thing is that the results of research on China are not completely consistent with the classical institutional theory (Chi and Fang, 2014). A study by Kolstad and Wiig (2012) found that the size of China's OFDI has a negative correlation with the quality of the host country's system. Dong Yan (2011) researched Chinese direct investment in Africa and Jiang Guanhong and Jiang Dianchun (2012) researched Chinese direct investment in developing countries. They also found that Chinese companies prefer to invest in host countries with higher institutional

risks. This shows that Chinese companies' OFDI behavior is different from traditional multinational companies and has its own uniqueness.

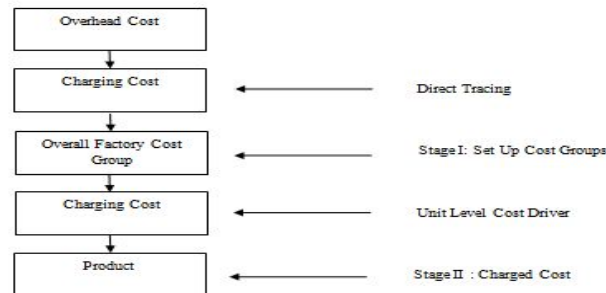


Fig. 1 Calculation of BOP with Traditional Accounting Methods [3]

C. The advantages and disadvantage of traditional accounting methods

The advantages of traditional accounting methods include [4]: Easy to Apply and Easy to Audit, While the disadvantage are [3]: The results of the offer are difficult to explain, Competitor prices seem unnatural, Products produced show high profits, The operational manager wants to stop products that seem profitable, Profit margins are difficult to explain, The company has a newbe which produces high profits, Customers do not complain about price increases, The accounting department spends a lot of time providing cost data for special projects, Some departments use an accounting system at their own expense and the last is Product costs change due to changes in financial reporting regulations

D. Activity Based Costing (ABC) System

Activity Based Costing System (ABC System) is used by modern companies to measure costs more accurately than traditional cost accounting methods. Basically the ABC system is a method of cost accounting for charging the cost of goods by adding up all the costs of activities that produce goods or services [5].

E. Basic Concepts of ABC System

The basic concept of Activity Based Costing basically appears because the traditional cost accounting system was deemed inadequate to meet the information needs of calculating the cost of goods needed accurately. There are two important assumptions underlying the Activity based costing method, are [4]:

a. Activities that incur costs, that auxiliary resources or indirect resources, provide the ability to carry out activities not just to cause costs.

b. Product or service customer, where the product causes the emergence of demand on the basis of activities to make products or services that are required by various activities that generate resources to carry out these activities.

In traditional accounting methods, BOP will be charged to the organizational unit, then then charged to each product or service. The loading procedure with this method is likely to distort the cost of the product or service. This distortion will become more serious when an important part of factory overhead is not related to output volume and the company produces products in various combinations with differences in volume, size, or complexity

This is different from the Activity Based Costing (ABC) method of the system. In the ABC method, tracking costs starts with the use of resources on activities and associates the costs of activities on products, services, or customers. The two stage procedure in the Activity Based Costing System method are [3] :

The first stage imposes factory overhead costs on the activity or activity cost center

The second stage imposes costs or activities from the activity cost shelter to the cost object by using an appropriate activity consumption cost driver that measures the demand for the cost object placed on the activity or activity shelter

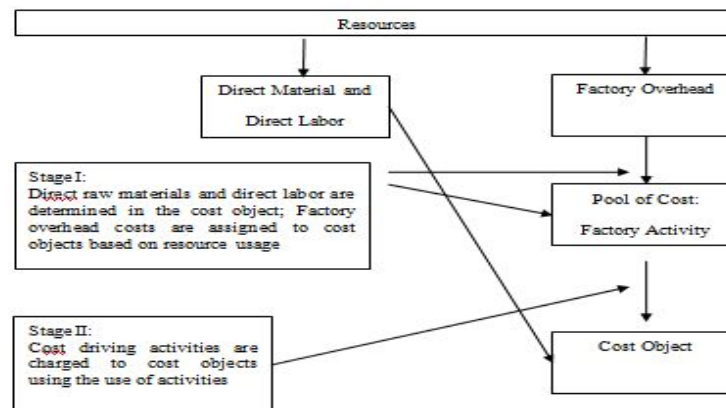


Figure 2 Two-Step Procedures on the Activity Based Costing System [6]

F. Advantages and Disadvantages of Activity Based Costing System

The ABC system method has the following advantages:

- a. Product costs are more realistic, especially in high-tech manufacturing industries where factory overhead is a significant proportion of total costs.
- b. More and more factory overhead costs can be traced to the product.

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- c. ABC recognizes that activities cause costs, not products, and products consume activities.
 - d. ABC focuses on the real nature of cost behavior and helps in reducing costs and identifying activities that do not add value to the product.

In addition, the ABC method also has the following disadvantages [6]:

- a. Allocation
- b. Some costs require allocations from departments and products based on changing measurements.
- c. Ignore costs
- d. Product costs identified by the ABC system do not cover all costs associated with the product.
- e. ABC systems require considerable time and money to develop and implement them.

G. Cost Hierarchy in the Activity Based Costing System Method

The cost hierarchy in ABC systems includes [2]:

- a. Output unit-level cost: Activity costs are imposed on each unit of individual product or service
- b. Batch- level cost: Activity costs associated with a group of units, products, or services and not with each individual product or service unit.
- c. Product-level cost: Costs of activities undertaken to support each product or service regardless of the number of units or batches made
- d. Facility-level sustaining cost : Activity costs that cannot be traced to individual products or services but support the company's overall operations.

H. Comparison of Traditional Accounting Methods and ABC Systems

- a. The ABC method uses activities as cost drivers to determine how much overhead consumption of each product. Whereas traditional accounting methods allocate overhead costs arbitrarily based on one or two non-representative allocation bases.
- b. The ABC method focuses on cost, quality and time factors while the traditional accounting method focuses on short-term financial performance such as earnings. If traditional methods are used to determine product prices and profitability, the numbers are not reliable.
- c. The ABC method has a much smaller need for variant analysis than the traditional method, because cost pools and cost drivers are more accurate and clear, and ABC

can use historical cost data at the end of the period to eliminate costs actual when a need arises [7].

I. Cost Driver

Cost driver is a cost trigger used to calculate the source cost of each unit of activity, then each resource cost is charged to a product or service by switching the cost of each activity to the quantity of each activity assumed at a certain period.

The main factor that must be considered in choosing the right cost driver are:

a. Degree of correlation

How clearly the cost driver expresses the consumption of the actual activity of the product, it can be measured by the degree of correlation between the quantity of activity traced on the product to the actual consumption of activity by the product.

b. Cost measurement

To reduce the measurement costs of activity triggers (cost of measurement), the ABC System uses triggers that are easily determined in quantity. Choosing a cost trigger that uses the number of transactions generated by the activity instead of a cost trigger based on the duration of the activity, can reduce the cost of measurement in designing an activity based cost system. Determining data from triggers based on the number of transactions is easily obtained, because transactions are generated when an activity is carried out.

c. Behavioural effects

In choosing cost drivers, the effect of using certain cost drivers for individual cost behavior in a company must be considered. Behavioral effects can be beneficial (beneficial) or dangerous (harmful). The beneficial behavior if the behavior due to the use of certain cost triggers is desired. While the effect is dangerous if due to the use of these triggers is not desirable.

d. Cost Efficiency

Efficiency is a measure of success judged by the amount of resources sacrificed to obtain certain results. Large companies with diverse types of activities have a large amount of expenses. If left unchecked, these expenses can have an impact on the decline in profits generated by the company. Therefore it is necessary to do cost efficiency in the company to reduce unnecessary expenses, so that there is no waste of costs [8].

Procedure for Overhead Charges using the ABC System Method

In the first stage, the determination of cost of goods based on activities involves the following four steps [9]:

1. Identify and classify costs into various activities
2. Link costs to activities

3. Identify Cost Drivers
4. Determine the cost / unit cost driver

$$\text{Rate per unit of cost driver} = \frac{\text{Amount of activity}}{\text{Cost driver}}$$

$$\text{Charged Overhead} = \text{Rate per Unit cost driver} \times \text{selected cost driver}$$

Furthermore, in the second stage of tracking and charging the cost of activities for each product using the cost driver with the formula [9]: After getting the results of overhead costs charged to each activity, the rates can be calculated using the formula [10]:

$$\text{Rate per room} = \text{Charged overhead} \times \text{expected profit}$$

III. RESEARCH METHOD

A. *The scope of research*

This study uses a comparative descriptive analysis with a quantitative approach that explains about a situation or an event that arises in the object of research, then compares with the conditions or variables applied by the research object. The quantitative approach is used to test a theory, to describe a fact and statistics that show the relationship between variables.

B. Types and Sources of Data

This study uses quantitative data types, namely data in the form of numbers and qualitative data, namely data in the form of documents sourced from primary data and secondary data. Primary data sourced from direct observation, interviews with relevant sections in accordance with the object of research, and written data collection. While secondary data by reading and studying books and literature relating to the issues raised in this study to obtain a theoretical basis that will be used in the discussion.

The data analyzed in this study is a collection of costs incurred due to activities that trigger it. The data includes fixed cost data (building depreciation and facility depreciation), variable cost data (doctor visit costs, consumables costs, consumption costs, water and electricity costs, administrative costs, laundry costs, and cleaning costs), and other supporting data (number of inpatients, length of stay, and room size).

IV. RESULTS AND DISCUSSION

Based on the results of interviews with the party of Hospitals X in Batam, Indonesia and based on data , the following results are obtained:

Tabel 1 Other Supporting Data

Class	Number of Patients (Person/People)	Long Stay (days)	Hospital Room Size (m ²)
VIP	188	376	65
I	513	1.026	50
II	1.555	3.110	60
III	3.611	7.222	70
Total	5.867	11.812	245

Source: Data processed, 2020

Costs included in inpatient service activities include :Nurse expenses, The cost of a doctor's visit, Consumption costs, Electricity and water costs, Consumables Cost, Laundry costs, Administration costs, Cleaning service costs, Building depreciation costs and Facility depreciation costs

Based on the costs above are grouped into several cost activities, i.e :

1. Activities of patient care services: Nurse salary costs
2. Doctor's visit activity: The cost of a doctor's visit
3. Patient service activities: Administration costs, Consumables Cost, Electricity and water costs, Cleaning service costs and Laundry Cost.
4. Patient care activities: Consumption Cost
5. Inventory and building maintenance activities: Building depreciation costs and Facility depreciation costs

The next step is to classify costs into various activities, i.e.:

1. Output unit-level cost: Nurse salary costs, Doctor's visit fee, Electricity and water costs, Laundry costs and Consumption costs
2. Batch- level cost: Administration costs, Consumables costs and Cleaning service costs
3. Facility-level sustaining cost: Building depreciation costs and Facility depreciation costs

Following are the calculation results obtained from each cost:

Table 2 Costs Based on Each Activity

No	Cost	Amount (IDR)
Output unit-level cost		
1	Nurse salary costs	489.600.000,-
2	Doctor's visit fee	586.700.000,-
3	Electricity and water costs	195.649.000,-
4	Laundry Cost	76.135.000,-
5	Consumption Cost	231.180.000,-
Batch- level cost		
6	Administration Cost	22.000.000,-
7	Consumables cost	4.060.800,-
8	Cleaning service cost	54.800.000,-
Facility-level sustaining cost		
9	Building depreciation costs	112.340.000,-
10	Facility depreciation fee	32.699.470,-
Total		2.205.164.270,-

Source: Data processed, 2020

After knowing each cost, the next step is to identify the cost driver to calculate the cost per unit cost driver, which is as follows:

Table 3 Identify Cost Drivers and Cost per Unit Cost Driver

No	Activity	Cost Driver	Amount (IDR)	Rate /Unit
1	Unit Level Activity Cost			

	Nurse Fee	11.812 days	489.600.000	41.449,37
	Doctor's visit fee	11.812 days	586.700.000	49.669,82
	Electricity cost			Equal to Rate
	• VIP	376 days	6.768.000	18.000,-
	• Class I	1.026 days	15.390.000	15.000,-
	• Class II	3.110 days	46.650.000	15.000,-
	• Class III	7.222 days	108.330.000	15.000
	Water Cost	11.812 days	18.511.050	1.567,13
	Laundry cost	5.867 people	76.135.000,-	12.976,81
	Consumption Cost	11.812 days	231.180.000	19.571,62
2	Batch Related Activity Cost			
	Administration cost	5.867 people	422.000.000	71.927,73
	Consumables cost			
	• VIP	188 people	4.060.800	21.600,00
	Cleaning service cost	11.812 days	54.800.000	4.639,34
3	Facility Sustaining Activity Cost			
	Inventory maintenance depreciation cost			Equal to rate
	• VIP	376 days	11.400.000	30.319,15
	• Class I	1.026 days	28.130.000	27.417,15
	• Class II	3.110 days	30.810.000	9.906,75
	• Class III	7.222 days	42.000.000	5.815,56
	Depreciation cost for building	5.677 m ²	32.699.470	5.677,00

Source: Data processed, 2020

The next step is to calculate the overhead costs charged to each class with the percentage of profit as follows:

Table 4 Percentage of expected profit

Class	Percentage of expected profit
VIP	25%
Class I	20%
Class II	15%
Class III	15%

Source: Data processed, 2020

Following are the results of inpatient service rate calculation based on the unit price cost driver each Class:

Table 5 Inpatient Services Rates Based on the ABC System

Class	Cost of Sales (IDR)	% Profit	Rate (IDR)
VIP	228.282,66	25%	285.353,32
I	209.789,75	20%	251.747,70
II	187.103,92	15%	215.169,50
III	181.815,85	15%	209.088,22

Source: Data processed, 2020

Table 6 Comparison of Inpatient Services Rates

Class	ABC rates (IDR)	Hospitals rates (IDR)
VIP	285.353,32	745.000,-
Class I	251.747,70	465.000,-
Class II	215.169,50	215.000,-
Class III	209.088,22	135.000,-

Source: Data processed, 2020

Calculation of inpatient services based on activity based costing system obtained a VIP rate of IDR 285,353.32; class I tariffs of IDR 251,747.70; class II tariffs of IDR 215,169.50; and class III tariff of IDR 209,088.22. When compared with the rates set by the Hospital, the difference obtained for the VIP class of IDR 459,646.68 and the difference for the class I of IDR 213,252.30 where the rate set by the Hospital is higher than it should be (over value). While the difference for class II is IDR 169.50 and the difference for class III is IDR 74,088.22 where the rate set by the Hospital is lower than it should be (under value).

V. CONCLUSIONS

From the calculations performed using the activity based costing system method, the hospital inpatient services for the VIP class is IDR 285,353.32; class I tariffs of IDR 251,747.70; class II tariffs of IDR 215,169.50; and class III tariff of IDR 209,088.22.

The difference in rates is due to the activity based costing method, the imposition of overhead costs on each product. In the traditional cost accounting method established by the RS, it uses unit-level activity costs to charge fees. The hospital only calculates the costs incurred such as salaries, water and electricity costs, consumption, and depreciation of facilities in determining the tariff for inpatient services, so that in calculating the basic price does not get the right results. While in the ABC method, overhead costs on each product are charged to many activities such as nurse salaries, doctor visit wages, administrative costs, consumption costs, laundry costs, consumables, cleaning service costs, and building depreciation costs, so in the ABC method able to allocate activity costs to each room appropriately based on the consumption of each activity, i.e. number of inpatient days, number of patients and room area per class so that the calculation of cost of goods and selling prices of services is more precise and accurate, so as to facilitate financial data users such as managers to make the right decisions in controlling costs to the service operational system and evaluating the performance of hospital managers. Based on the conclusions above, the authors' suggestion for the hospital is that the hospital management should start considering the calculation of inpatient rates using the activity based costing system method because these calculations provide more accurate cost information. But still consider external factors such as competitor rates and the ability of the community that can influence the pricing of inpatient services.

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