Decision Making of Telecommunication Device Calibration Rates

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Abstract. To guarantee the quality system of testing telecommunication tools or equipment and referring to the testing quality management system that refers to ISO 17025, telecommunications tools or equipment must guarantee the traceability of these measuring instruments, so that a series of activities need to be carried out to compare the truth values of measuring instruments and measuring materials which are traced to national and international units called calibrations. Calibration rates based on government regulation No. 80 of 2015 have not seen differences in the calibration costs of the type of measuring instrument and the size of the different measuring ranges, so that with reference to the calibration tariff based on the PP it has not seen a reasonable tariff, therefore a reasonable calibration rate will be prepared. and calibration rates will be made standard rates that can be accepted in the community involved in carrying out the calibration process. In cost accounting known as the activity-based costing and double distribution methods, both of these methods will be used in preparing the calibration rates, which of the two methods will show which method is right regarding the preparation of the calibration rates for telecommunication tools or equipment. Calibration rates for spectrum analyzers, signal generators, with a frequency range of 10 Hz - 26 GHz which are calculated by the ABC method rates of Rp 4,336,000, while in the measuring range 10 Hz - 13.6 GHz for Rp 2,168,000, for calculations with DD method, a device with a measuring range of 10 Hz - 13.6 GHz is: Rp. 1,696,414, and for a measuring range of 10 Hz - 13 GHz is Rp. 3,392,828. After conducting discussions and questionnaires with five informants by their scholarship, the exact method used in compiling telecommunication equipment calibration rates is the activity-based costing method.

1. Introduction

In the attachment of Government Regulation No. 80 of 2015 concerning types and tariffs on non-tax state revenues that apply to the Indonesian Ministry of Communications and Information Technology, that in the attachment to the PP, the calibration rates have not seen any differences between the groups and calibration measurement ranges so that the calibration rates still calculated the same for the type of measuring instrument and measuring range. Tariffs are fees that must be paid or levied on goods entering or leaving beyond national borders. Referring to the results of customer complaints regarding telecommunication equipment calibration tariffs, referring to data obtained in the field based on data

sources obtained about complaints, that the number of customer complaints against the calibration tariff for measuring instruments is as follows:

- Complaints regarding the different types of measuring instruments sampled in the calibration process, that the magnitude of the tariff charged is still calculated at the same cost.
- In the imposition of costs not yet seen differences in tariff groups between different frequency range measurements.

Calibrated telecommunications equipment is a measuring device that has different characteristics in each calibration handling, for example calibrated measuring devices are spectrum analyzers, signal generators, attenuators, EMC analyzers, and frequency counters, which measure the frequency range or different measuring ranges according to the model and serial number. For measuring devices with a frequency range of 10 Hz - 13.6 GHz, the process of handling the calibration of the measuring instruments is completed within one working day, while for measuring instruments with a measuring range of 10 Hz to 26 GHz the calibration process is completed within two working days, in the process of handling the calibration of measuring devices have different levels of difficulty - different according to the type and specifications of the calibrated measuring instrument.

2. Literature Review

The study aims to determine the application of activity-based costing methods in determining the number of inpatient services at Bethesda Tomohon public hospital [1]. The purpose of this studyis to analyze theroom rates of hospitalization based method ABC (Activity Based Costing) Double distribution approach. The method usedin this study is qualitative analyzes presented tariff and quantitative methods [2]. This research is meant to find out the implementation of activity based costing in determining the laboratory diagnostic service cost at Laboratorium Klinik Prima accurately. The activity based costing method is conducted by identifying activities and correlating it with cost driver to calculate cost pool rate in the allocation of overhead cost, so cost distortion does not occur in the determination of diagnostic cost [3]. A method of Activity Based Costing (ABC), was a new methods that would improve details carefulness in the cost of, imposition and accuracy of the fees are accurate. This method identify all kinds of activities that have done in an organization and collects the cost with a base that existed from those activities [4]. To determine the unit cost calculation by ABC method and DD Method of Category 2 pulmonary TB in Outpatient and Inpatient Installation of Lung Hospital [5]. This study aims to determine and analyze the costs consumed for one-time delivery with the normal method at Panembahan Senopati Hospital Bantul. The data used are primary data and secondary data. Primary data obtained through interviews with related parties, while secondary data are sourced from RSUD Panembahan Senopati [6].

3. Methodology

Telecommunication tool or device calibration tariff calculation using the Activity Based Costing System and Double Distribution methods.

The steps of data analysis are :

3.1 Determine the elements that cause the tariff of testing and or calibration of telecommunication tools or equipment.

3.2 Calculating the test and/or calibration rates for telecommunications equipment or devices using the Activity Based Costing System and Double Distribution.

The steps in implementing the Activity Based Costing System in this study are as follows :

- Identifying activities
- Classify rates based on activity into various activity levels.
- Identify cost drivers.
- Determine the rate per unit cost driver.

The number of samples used in this calculation is a random sample that is the probability sampling method is done by simple random method

N = 79

$$n = \frac{79}{1+(79\times 0.1^2)}$$

n = 45 Sample

Table 1. Calibration Rates based on ABC method

	Fees Charged		Tariff	
Samples		**Annual Expense**	**Per month**	**Per week**
45	Rp 5.853.600.613	Rp 487.800.051	Rp 10.840.001,14	**Rp 2.168.000,23**

Referring to the tariff based on PP 80 of 2015, there was an over cost for the cost of calibration of the spectrum analyzer frequency counter EMC analyzer signal generator with a frequency range up to 13.6 GHz in the amount of Rp. 3,000,000 - Rp. 2,168,000 = Rp. 831,999.77, whereas for attenuator calibration costs there is an additional calibration fee of Rp 168,000 thousand. As for the cost of calibration of spectrum analyzers, signal generators, EMC Analyzers with frequencies up to 26 GHz, the rate is doubled with the assumption that the length of the calibration work takes 2 (two) days, compared with calibration spectrum analyzer signal generators and EMC analyzers with frequency ranges up to with 13.6 GHz done in one day, so the calibration rate is: 2 x Rp. 2,168,000 = Rp 4,336,000

Calculations using the DD method are carried out with the stages of distributing costs from supporting units to production units. The first phase costs from the supporting unit are distributed to other supporting units. Furthermore, the costs of the first distribution support unit are distributed to the production unit. Unit cost calculation is done by dividing each cost incurred to the production unit that has been added to the cost of the supporting unit in the second distribution stage with several service outputs provided by the production unit. The assumptions used in the DD method include the floor area for the distribution of building maintenance costs; the number of human resources and their education for the distribution of human resources and administrative costs.

Table 2. Cost based on DD method

Fixed Costs	Variable Costs	Total costs
Rp 53.210.129	Rp 99.467.150	Rp 152.677.279

So the magnitude of the unit cost of measuring instrument calibration is the result of total costs in total cost divided by the number of samples so that the calibration rate of the measuring instrument is Rp 3,392,828. Referring to the logbook for measuring the operation of the aforementioned measuring devices, this calibration rate applies to the calibration of the spectrum analyzer measuring instrument with a measurement range of 10 Hz - 26 GHz, Signal Generator with a measuring range of 10 Hz - 26 GHz. For calibration rates for spectrum analyzer and signal generator measuring devices with a measurement range of 10 Hz - 13, 6 GHz (one-day calibration work) calibration rates are Rp. 3,392,828 / 2 = Rp. 1,696,414.

4. Result and Discussion

The following table displays the results of the preparation of the calibration tariff calculation of the measuring instrument with ABC and DD methods compared to the rates currently in force in PP No. 80 of 2015, thus it will be seen the difference in rates from the methods used in the preparation that has been done.

Table 3. Calibration tariff comparison table

EUT	PP Tariff No 80	ABC Method	DD Method
Spectrum Analyzer	Rp 3000.000	10 Hz – 13,6 GHz = **Rp 2.168.000** 10 Hz – 26 GHz = **Rp 4.336.000**	10 Hz – 13,6 GHz = **Rp 1.696.414** 10 Hz – 26 GHz = **Rp 3.392.828**
EUT	PP Tariff No 80	ABC Method	DD Method
Signal Generator	Rp 3000.000	10 Hz – 13,6 GHz = **Rp 2.168.000** 10 Hz – 26 GHz = **Rp 4.336.000**	10 Hz – 13,6 GHz = **Rp 1.696.414** 10 Hz – 26 GHz = **Rp 3.392.828**
Frequency Counter	Rp 3000.000	10 Hz – 26 GHz = **Rp 2.168.000**	10 Hz – 26 GHz = **Rp 1.696.414**
EMC Analyzer	Rp 3.500.000	10 Hz – 13,6 GHz = **Rp 2.168.000** 10 Hz – 26 GHz = **Rp 4.336.000**	10 Hz – 13,6 GHz = **Rp 1.696.414** 10 Hz – 26 GHz = **Rp 3.392.828**
Attenuator	Rp 2.000.000	10 Hz – 26 GHz = **Rp 2.168.000**	10 Hz – 26 GHz = **Rp 1.696.414**

In connection with calculating the rate per unit, there are 2 (two) cost accounting system flows that can be used, namely DD and ABC cost accounting systems. In the cost accounting system with the ABC method, services or products use activities, then activities use resources and emphasize the causal relationship. The trigger is the cause of the activities and activities that cause an influence on the cost driver, while the double distribution method is a method of allocating costs at the supporting cost center to the production cost center through two stages.

From the results of the discussion the benefits of the ABC method include :

- Determine the price of products or services more accurately, especially to eliminate the presence of cross-subsidies so that there is no longer the imposition of certain types of cost of goods is too high (over costing) and the cost of other types of products is too low (under costing).
- Improve decision making.
- Using the ABC method not only provides more accurate information about the cost of the product or service, but also provides information for decision-makers about the activities that cause costs, especially indirect costs, which are important for management in making good decisions about the product and in managing activities so as to increase business efficiency and effectiveness.
- Enhance control over overhead costs. Overhead costs are caused by activities that occur in the company. The ABC method makes it easy for decision-makers to control activities that generate overhead costs.

Referring to the results of the questionnaire that was chosen by the respondent, the telecommunication equipment calibration tariff was chosen alternative by following the preparation of the activity-based costing method compared to using the double distribution method and the existing rates in PP No. 80 of 2015, with relevant reasons as stated contained in the benefits - benefits that have been mentioned above one of them by using the activity-based costing method looks more accurate and detailed, because it takes into account the activities that cause the cost trigger.

5. Conclusion

In connection with the main objective of this research is to determine the right method related to the calculation of the calibration rates of telecommunications equipment or devices using the Activity-based costing and double distribution methods, concerning the main objectives of the thesis, then some conclusions from the research are described:

- After calculating the calibration rates using the activity-based costing method, which is calculated based on the activities that cause cost drivers, a calibration tariff is obtained for measuring spectrum analyzer, signal generator, and EMC analyzer with a measuring range of 10 Hz - 13.6 GHz of Rp.2,168,000, the calibration rate for attenuator devices and frequency counter charged is Rp2,168,000, while for the measurement range of 10 Hz - 26 GHz obtained a calibration rate of Rp 4,336,000.
- Calculation of calibration rates using the double distribution method for measuring spectrum analyzer, signal generator, attenuator, frequency counter, and EMC analyzer with a measuring range of 10 Hz - 13.6 GHz for Rp 1,696,414, calibration rates for attenuator and frequency devices The counter tariff charged is Rp 1,696,414, while for the measuring range of 10 Hz - 26 GHz a calibration rate of Rp 3,392,828 is obtained.
- Referring to the formulation of the problem in this study regarding the appropriate method in compiling the calibration tariff for measuring instruments or telecommunications equipment, the answer to the problem formulation is to use the activity-based costing method.

Rerefences

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