

Activity Based Costing on Service Rates of Radiology Unit In Unimus Dental Hospital

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Submission date: 27-Jul-2020 08:16AM (UTC+0700)

Submission ID: 1362523535

File name: JMMR_Publish.docx (49.5K)

Word count: 2270

Character count: 12335

Activity Based Costing on Service Rates of Radiology Unit In Unimus Dental Hospital

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INDEXING

Keywords:

Activity Based Costing;
Service;
Radiology Unit;

ABSTRACT

Unimus Dental Hospital is a new healthcare provider. Pricing decisions should be made strategically to meet consumers' perceived value thus not resulting a price that is too high or too low and a loss to the hospital. ABC method has been recommended to improve hospitals' resource management in the United States. ABC is used to identify, describe, assign costs to, and report on agency operations. This study uses a descriptive-qualitative open-end case study approach in the form of Focus Group Discussion (FGD). The results showed a consideration of service rates of radiology unit in Unimus Oral and Dental Hospital using ABC method were Rp. 193.037 for Cephalometric Radiograph, Rp. 162.624 for Orthopantomograph (OPG), Rp. 138.181 for bitewing radiograph and Rp. 162.624 for temporomandibular joint radiograph (TMJ).

Kata kunci:

Pembebanan
Berdasarkan Aktivitas;
Pelayanan ;
Unit Radiologi;

Rumah sakit Gigi dan Mulut Unimus merupakan sebuah rumah sakit baru yang harus dapat menentukan harga pokok dengan tepat agar tidak mengalami kerugian karena harga terlalu rendah atau harga terlampau tinggi sehingga tidak menjangkau masyarakat. Metode ABC telah disarankan penggunaannya untuk organisasi rumah sakit di Amerika Serikat guna memperbaiki pengelolaan sumber daya. Jenis penelitian yang digunakan adalah deskriptif kualitatif dengan rancangan penelitian studi kasus dilakukan open end method berupa Focus Group Discussion (FGD). Hasil akhir dari pelayanan di unit radiologi dengan menggunakan metode ABC didapatkan tarif termurah pada pelayanan Rontgen Cephalometri dengan harga Rp. 193.037, diikuti tarif Rontgen Panoramik (OPG) dengan harga Rp. 162.624, diikuti tarif Rontgen Bitewing dengan harga Rp. 138.181, diikuti tarif Rontgen TMJ dengan harga Rp. 162.624.

INTRODUCTION

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Regulation of The Minister of Health in 2004, explained dental hospital is a healthcare service facility, provides dental health for treatment and complete recovery services. Dental hospital is built to provide facilities to improve the quality of service, education, research in field of oral and dental health from basic to specialist level in the form of primary, secondary and tertiary dental medical services in accordance with the demands of the community.

Unimus Dental Hospital is a new hospital. Thus, they should be able to determine cost to avoid loss and to be able to meet consumer's perceived value and not resulting a price that is too high or too low. Market conditions signify the need for better efficiency standards in the use of resources, mainly due to the degree of variation in maintenance and the complexity and improvement of technology (1).

Activity-based costing (ABC) method has been recommended to improve hospitals' resource management in United States (9). It also has been applicable in many health service and hospitals in developed country (2). ABC refines a costing system by identifying individual activities as the fundamental cost objects. It assigns the cost of each activity or services to products according to the actual consumption by each (3). Therefore, ABC method provides rate/tariff information accurately (4). Based on managerial perspectives, a feature of this method is the ability to diagnose exact costs and to present the non-financial information to improve the performance and efficiency of activities. In addition, it also accurately tracks costs to cost objects (5)

Unimus dental hospital has several specialized units to meet the varied needs such as Pharmacy Unit, Radiology Unit, and Clinical Laboratory Unit. Pricing decisions should be made in Radiology Unit because it is considered as a new unit. The ABC system of cost is chosen as analyses tool which has been remarkably success to measure costs accurately than conventional methods or other methods.

RESEARCH METHOD

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This study used a descriptive-qualitative open-end case study approach in the form of Focus Group Discussion (FGD). Both primary and secondary sources were used in this study.

RESULT AND DISCUSSION

The calculated of Activity Based Costing method was cited from Hansen (6).

Activity Cost

List of indirect cost as seen in Table 1 and list of direct cost as seen in Table 2 were assigned to activity cost.

Determine The Cost Driver

The management of RSGM Unimus assumes 15 patients day in the radiology unit. Assuming there are 15 patient day for three shift with 6 working days in a week. The number of patients years would be 4320.

Table 1. Indirect Cost

Cost Center	Cost Driver		Cost Allocation	
	Unit	Annual quantity of Unit		
Building Maintenance	2 Number of patient	4320	Rp	60,000,000
Treatment Facilities (CBCT Rontgen)	Number of patient	4320	Rp	25,000,000
Sanitation	Number of patient	4320	Rp	120,000,000
Rontgen CBCT Depreciation	Number of patient	4320	Rp	54,000,000
Ac Maintenance	Number of patient	4320	Rp	6,000,000
AC	Number of patient	4320	Rp	4,000,000
Consultation chair	Number of patient	4320	Rp	10,000,000
Office stationery (+ medical records + maintenance software cbct)	2 Number of patient	4320	Rp	21,600,000
Electricity	Number of patient	4320	Rp	40,000,000
Water	Number of patient	4320	Rp	12,000,000
Security (1 person)	Number of patient	4320	Rp	45,600,000
Cleaning staff salary (1 person)	Number of patient	4320	Rp	45,453,000
X-ray printing machine	Number of patient	4320	Rp	9,500,000

Table 2. Direct Cost

Cost Center	
Disposable medical device each treatment	
Specialist doctor salary	Rp 72,000,000
Two paramedic salary	Rp 52,800,000
TOTAL	Rp 124,800,000

Determine Rate per Unit

Rate per unit is illustrated by Table 3, and was determined using the formula:

$$= \frac{\text{number of activity}}{\text{cost driver}}$$

Calculate the Direct Material

Table 4 shows several material and disposable medical devices in radiology unit.

Calculate The Fixed Rate of every service in Radiology Unit

Radiology unit provides 15 services, detailed information to calculate the fixed rate of every services in radiology unit are:

1. Assigned overhead was calculated into each activity. The formula to calculate overhead cost:

$$\text{Assigned BOP} = \text{Cost driver rate per unit} \times \text{determined driver}$$

2. All grouped cost activities was sum up,

3. The total activity cost of each service was divided by the number of patients per action.

Table 3. Rates Per Unit

Cost Center	Cost Driver		Cost Allocation	Rate / Unit (Rp)
	Unit	Annual quantity of Unit		
Building Maintenance	Number of patient	4320	Rp 60,000,000	Rp 13,889
Treatment Facilities (CBCT Rontgen)	Number of patient	4320	Rp 25,000,000	Rp 5,787
Sanitation	Number of patient	4320	Rp 120,000,000	Rp 27,778
Rontgen CBCT Depreciation	Number of patient	4320	Rp 54,000,000	Rp 12,500
Ac Maintenance	Number of patient	4320	Rp 6,000,000	Rp 1,389
AC	Number of patient	4320	Rp 4,000,000	Rp 926
Consultation chair	Number of patient	4320	Rp 10,000,000	Rp 2,315
Office stationery (+ medical records + maintenance software cbct)	Number of patient	4320	Rp 21,600,000	Rp 5,000
Electricity	Number of patient	4320	Rp 40,000,000	Rp 9,259
Water	Number of patient	4320	Rp 12,000,000	Rp 2,778
Security (1 person)	Number of patient	4320	Rp 45,600,000	Rp 10,556
Cleaning staff salary (1 person)	Number of patient	4320	Rp 45,453,000	Rp 10,522
X-ray printing machine	Number of patient	4320	Rp 9,500,000	Rp 2,199

Table 4. Direct Material

Materials	Quantity	Unit	Price	Price per unit
Hijab medical mask	50	patient	21,000	Rp 420
Medical mask	50	patient	21,000	Rp 420
Handsocon	50	patient	38,000	Rp 760
Tissue	150	patient	35,000	Rp 233
Film Cephalometric	125	patient	5,148,000	Rp 41,184
Hand rub	50	patient	105,000	Rp 2,100
Total				Rp 45,117

There are four types of Rontgen services which are able to consider as follows: Cephalometric Radiograph as shown as table 5, Orthopantomograph (OPG) as shown as table 6, bitewing radiograph as shown as table 7 and temporomandibular joint radiograph (TMJ) as shown as table 8. While, table 9 shows the result of focus group discussion with director and vice director of Unimus Oral and Dental Hospital

Tabel 5. Cephalometric radiograph rate calculation

Activity	Cost Driver Rate	Cost Driver	Total (Rp)
Building Maintenance	⁸ Rp 13,889	6.75	Rp 93,751
Treatment Facilities (CBCT Rontgen)	Rp 5,787	4320	Rp 24,999,840
Sanitation	Rp 27,778	288	Rp 8,000,064
Rontgen CBCT Depreciation	³ Rp 12,500	4320	Rp 54,000,000 ¹
Ac Maintenance	Rp 1,389	4320	Rp 6,000,480
AC	Rp 926	4320	Rp 4,000,320
Consultation chair	Rp 2,315	4320	Rp 10,000,800
Office stationery (+ medical records + maintenance software cbct)	Rp 5,000	4320	Rp 21,600,000
Electricity	Rp 9,259	288	Rp 2,666,592
Water	Rp 2,778	4320	Rp 12,000,960
Security (1 person)	Rp 10,556	4320	Rp 45,601,920
X-ray printing machine	Rp 2,199	4320	Rp 9,499,680

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Cleaning staff salary (1 person)	Rp 10,522	288	Rp 3,030,336
Specialist doctor salary	Rp 16,667	4320	Rp 72,001,440
Two paramedic salary	Rp 12,222	4320	Rp 52,799,040
BMHP Cephalometric Rontgen	Rp 45,117	4320	Rp 194,905,440
Total cost in a year			521,200,663
Total patient in a year			4320
Cephalometric Rontgen cost			120,648
Profit 50%			60,324
Medical services 10%			12,065
Total rate			Rp193,037

Tabel 6. Orthopantomograph (OPG) rate calculation

Activity	Cost Driver Rate	Cost Driver	Total (Rp)
Building Maintenance	Rp 13,889	6.75	Rp 93,751
Treatment Facilities (CBCT Rontgen)	Rp 5,787	4320	Rp 24,999,840
Sanitation	Rp 27,778	288	Rp 8,000,064
Rontgen CBCT Depreciation	Rp 12,500	4320	Rp 54,000,000
Ac Maintenance	Rp 1,389	4320	Rp 6,000,480
AC	Rp 926	4320	Rp 4,000,320
Consultation chair	Rp 2,315	4320	Rp 10,000,800
Office stationery (+ medical records + maintenance software cbct)	Rp 5,000	4320	Rp 21,600,000
Electricity	Rp 9,259	288	Rp 2,666,592
Water	Rp 2,778	4320	Rp 12,000,960
Security (1 person)	Rp 10,556	4320	Rp 45,601,920
X-ray printing machine	Rp 2,199	4320	Rp 9,499,680
Cleaning staff salary (1 person)	Rp 10,522	288	Rp 3,030,336
Specialist doctor salary	Rp 16,667	4320	Rp 72,001,440
Two paramedic salary	Rp 12,222	4320	Rp 52,799,040
BMHP Orthopantomograph	Rp 26,109	4320	Rp112,790,880
Total cost in a year			439,086,103
Total patient in a year			4320
Orthopantomograph cost			101,640
Profit 50%			50,820
Medical services 10%			10,164
Total rate			Rp162,624

Table 7. Bitewing radiograph rate calculation

Activity	Cost Driver Rate	Cost Driver	Total (Rp)
Building Maintenance	Rp 13,889	6.75	Rp 93,751
Treatment Facilities (CBCT Rontgen)	Rp 1,505	4320	Rp 6,501,600
Sanitation	Rp 27,778	288	Rp 8,000,064
Rontgen CBCT Depreciation	Rp 1,505	4320	Rp 6,501,600
Ac Maintenance	Rp 1,389	4320	Rp 6,000,480
AC	Rp 926	4320	Rp 4,000,320
Consultation chair	Rp 2,315	4320	Rp 10,000,800
Office stationery (+ medical records + maintenance software cbct)	Rp 5,000	4320	Rp 21,600,000
Electricity	Rp 9,259	288	Rp 2,666,592
Water	Rp 2,778	4320	Rp 12,000,960
Security (1 person)	Rp 10,556	4320	Rp 45,601,920
X-ray printing machine	Rp 2,199	4320	Rp 9,499,680
Cleaning staff salary (1 person)	Rp 10,522	288	Rp 3,030,336
Specialist doctor salary	Rp 16,667	4320	Rp 72,001,440
Two paramedic salary	Rp 12,222	4320	Rp 52,799,040
BMHP Bitewing radiograph	Rp 26,109	4320	Rp112,790,880
Total cost in a year			373,089,463
Total patient in a year			4320
Orthopantomograph cost			86,363
Profit 50%			43,182
Medical services 10%			8,636
Total rate			Rp138,181

Table 8. Temporomandibular joint radiograph (TMJ) rate calculation

Activity	Cost Driver Rate	Cost Driver	Total (Rp)
Building Maintenance	Rp 13,889	6.75	Rp 93,751
Treatment Facilities (CBCT Rontgen)	Rp 5,787	4320	Rp 24,999,840
Sanitation	Rp 27,778	288	Rp 8,000,064
Rontgen CBCT Depreciation	Rp 12,500	4320	Rp 54,000,000
Ac Maintenance	Rp 1,389	4320	Rp 6,000,480
AC	Rp 926	4320	Rp 4,000,320
Consultation chair	Rp 2,315	4320	Rp 10,000,800
Office stationery (+ medical records + maintenance software cbct)	Rp 5,000	4320	Rp 21,600,000
Electricity	Rp 9,259	288	Rp 2,666,592
Water	Rp 2,778	4320	Rp 12,000,960
Security (1 person)	Rp 10,556	4320	Rp 45,601,920
X-ray printing machine	Rp 2,199	4320	Rp 9,499,680
Cleaning staff salary (1 person)	Rp 10,522	288	Rp 3,030,336
Specialist doctor salary	Rp 16,667	4320	Rp 72,001,440
Two paramedic salary	Rp 12,222	4320	Rp 52,799,040
BMHP Bitewing radiograph	Rp 26,109	4320	Rp112,790,880
Total cost in a year			439,086,103
Total patient in a year			4320
Orthopantomograph cost			101,640
Profit 50%			50,820
Medical services 10%			10,164
Total rate			Rp162,624

Table 9. Focus group discussion result

Question	Code	Interview Transcript
What is the expected value of the profit?	1	<p>Director: The director wants a 50% profit for services to the radiology unit</p> <p>Vice director: 30% profit is considered more than enough for radiology services</p>
What is the expected value of medical service?	2	<p>Director: Medical services rates are as expected, 5% for each service</p> <p>Vice director: Medical services rates are as expected, 10% for each service.</p>
What is the number of assumption of cost driver for each treatment?	3	<p>Director: The number of cost driver for each treatment is based on patient data in Unimus oral and dental hospital in March 2018-February 2019</p> <p>Vice director: The number of cost driver for each treatment is based on patient data in Unimus oral and dental hospital in March 2018-February 2019</p>
What is the number of estimation of patients seen per day?	4	<p>Director: ⁷ The number of estimation of patients seen per day is 15.</p> <p>Vice director: ⁷ The number of estimation of patients seen per day is 15.</p>
Is the specified rate/tariff is as expected?	5	<p>Director: Yes, the tariff is as expected.</p> <p>Vice director: Yes, the tariff is as expected.</p>

Table 10. TMJ Rontgen

No	Service	Rate
1	Cephalometric Rontgen	Rp 193,037.00
2	Panoramic Rontgen (OPG)	Rp 162,624.00
3	Bitewing Rontgen	Rp 138,181.00
4	TMJ Rontgen	Rp 162,624.00

CONCLUSION

The results showed a consideration of service rates of radiology unit in Unimus Oral and Dental Hospital using ABC method were Rp. 193.037 for Cephalometric Radiograph, Rp. 162.624 for Orthopantomograph (OPG), Rp. 138.181 for bitewing radiograph and Rp. 162.624 for temporomandibular joint radiograph (TMJ).

ACKNOWLEDGMENT

We would like to thank to Muhammadiyah University of Semarang for granting this research.

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