

Activity Based Costing to Determine Tuition Fee in University:

A case study

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Abstract—Since the competition between universities become more competitive thus it raises the urge to the universities to increase their quality, service and facilities. As an impact, universities need more fund to improve their quality. Even though universities are nonprofit organization, universities need the fund to support their operational activities and most private universities rely on tuition fee. Thus, university needs accurate cost calculation to support their activities. One of the best costing method is Activity Based Costing (ABC). The aim of this research is to determine tuition fee in a private university by using ABC calculation. This research uses a descriptive qualitative and within this qualitative research paradigm, a case study design is used to explain the calculation process. The results found that ABC can provide accurate cost allocation to determine the optimum tuition fee for each student. The number of paper that discussing ABC implementation in higher education institution in Indonesia is still limited, thus this paper adds the number of papers that provide ABC calculation to determine optimum tuition fee in a higher education institution.

Keywords—ABC; cost drivers; private universities; tuition fee

I. INTRODUCTION

In the globalization era, competition between universities is more competitive. Students have a wide range of option to choose universities. This condition causes universities to increase their quality by providing qualified lecture, great service and sufficient facilities to support the teaching and learning process. As a consequence, universities need to get enough source of funding. In practice, private universities rely on tuition fee and this condition causes a dilemma. Since there is a trade-off between tuition and quality, universities need to decide whether they want to increase their quality or not. Higher quality means a higher cost and students must cover this cost. Therefore, universities need to calculate their cost carefully to determine the optimum tuition fee.

Activity Based Costing (ABC) is one of costing method that provides more accurate calculation than traditional costing. Normally, ABC is used in manufacturing companies. However, previous research shows that ABC can also be used in a service industry including educational institutions [1-6].

Previous studies do not provide detail ABC calculation in the service industry. For example, studies conducted by Carmo and Padovani and Port and Burke focus on advances and challenges in ABC implementation [1,7]. While studies conducted by Toompuu and Polajeva, and Balachandran and Babad, focus on cost drivers in educational institutions. In addition, studies conducted by Moghadam focus on the ABC model in a university [3,8,9]. Those researches do not focus on detail calculation of ABC thus our study makes a contribution to the practice by providing the ABC calculation in a higher education institution and uses the calculation to set an optimum tuition fee. By using more accurate calculation, both universities and students will get the benefits. Universities can provide qualified service for the students at a reasonable price. The result of this research shows that ABC can provide accurate cost allocation to determine the optimum tuition fee.

II. LITERATURE REVIEW

The ABC system emerges in 1980 due to the dissatisfaction of accounting and management experts of traditional management accounting information [6]. Experts accuse that traditional costing failed to provide accurate information to support the decision-making process [6,10]. This was the reason behind the invention of ABC by Robin Cooper and Robert Kaplan.

However, at the very beginning, the implementation of ABC is merely focused on manufacturing companies. The manufacture companies got benefits from appropriate cost driver that lead to more accurate allocation system, including transaction costing and long-term variable cost [11]. One of the earliest studies about ABC implementation in universities were started in 1989 by Port and Burke [12]. They found that ABC support academic managers to understand factors that influence costs, thus it leads to better decision-making process [12]. The result aligned to research conducted by Mitchell in 1996, where he found that the ABC system improved cost awareness in the organization [4]. Later, in 1998, Moore evaluated the ABC implementation in a private university. He found that the ABC system provided more useful information compared to information provided by financial accounting system [6]. However, in implementing the ABC system, adjustments such

as classification of activities and cost driver determination should be made due to the different nature of manufacturing companies and academic institution. In 2001, Carsten highlighted the importance of cost driver selection in the ABC system. He argued that there is a trade-off between accuracy and complexity of the ABC system. To overcome this problem, he made a mathematical model to support optimal cost driver selection [13]. Finally, in 2014, Toompu and Polajeva found in order to improve the accuracy and credibility of ABC calculation, a university should select an optimum number of cost drivers. They also revealed a list of cost drivers that can be used by a university [8].

Educational institution is a supplier that should sell their products in a competitive market, universities need to be aware that if their products are too high there is a risk that the products are not competitive in the market [1]. Thus, there is a trade-off between quality and price. Port and Burke found that ABC helps in the decision-making process by giving a deeper understanding to the academic manager about factors that influence teaching cost and also the cost of individual courses, therefore universities can set priorities between quality and price after considering teaching cost [1,12]. The option between quality and price will determine the competitive advantage of each university. Universities can choose the options offered by Porter generic competitive strategies model which are cost leadership, differentiation and focus [14].

A. ABC Implementation in Universities

The implementation of an ABC system in universities is slightly different from the ABC implementation in a manufacturing organization. There are six steps in implementing ABC in universities [2]:

- Identifying cost objects
- Identifying outputs
- Identifying activities
- Allocating resources and making cost pools
- Linking activity costs to output
- Analysis and cost reporting

On the other hand, Cropper argue that steps in implementing ABC in universities are [12]:

- Identifying resource cost
- Identifying products
- Identifying activities
- Assign resource costs to activities
- Link the activities to the products using cost drivers
- Analyse and reporting

Since the study conduct by Cropper is more recent and describe more detail steps, thus this paper is conducted according to Cropper [12].

B. Hierarchical Classification of Activities

Tatikonda create a comparison of activity in manufacturing and university. Similarly, with activity level in manufacturing, break down activities in universities into 3 levels; unit level, batch level and product level [2]. While Cropper add one more level which is facility level, to the hierarchy. This method can be modified to fit universities need [12].

Tatikonda and Cropper gives the example of hierarchical classification of activities in universities that can be seen below [2,12]:

- Grading papers is a unit level,
- Lecturing to class is a batch level,
- Course design activities is a product level and
- General administration is a facility level

C. Cost Drivers

A unique characteristic of universities causes a unique cost driver. Study conduct by Toompuu and Cropper identify 8 cost drivers that commonly used by universities [8,12]:

- Time spent
- Square meters
- Number of staff
- Number of lectures
- Number of researchers
- Number of research
- Number of students
- Total cost

In determining cost drivers, management needs to decide the right number of cost drivers [13]. If the cost drivers are limited it may cause the calculation inaccurate. On the other hand, if the cost drivers are too many it may cause a problem in ABC calculation. In general, academic managers take five to nine cost drivers [12]. Cokins argue that cost drivers should consider the degree of complexity, diversity and variation of the product [15]. It also needs to consider the degree of accuracy of calculation and degree of usefulness of information.

D. Barriers and Benefits in Implementing ABC

Universities have a unique context thus it creates some difficulties in implementing ABC [4]. These difficulties create a condition that caused universities reluctant to implement ABC System. Tatikonda and Cropper argue that the implementation of the ABC system in universities has been slow [2,12]. This is happening because universities have difficulties in finding capable resources, agreeing to cost drivers, lack of understanding of the methods and problem in gaining commitment from academic managers [4,12,16]. On the other hand, universities that implemented ABC believe that the benefits of ABC implementation exceed the cost of ABC implementation. Mitchell argues that ABC enhances the cost

accuracy thus it leads to a better decision making process [4]. While Ruhupatty said that ABC enables academic managers to increase quality, efficiency and reduce the number of non-value added activities [17].

III. METHOD

A Deductive approach has been chosen to conduct this study because there is a need to depict the phenomenon. In addition, the nature of the topic may not be suitable for quantitative measures [18]. Within this qualitative paradigm, a case study design is chosen because it can explain a particular process [19]. This study uses embedded single case design so that the detail calculation can be made. The sample is one of faculty in a private university in Cimahi. The sample has been chosen due to the feasibility of data.

In order to enhance internal validity, this study performed data triangulation by data source and data type [20]. Triangulation by data source performed through a separate semi-structured interview with 7 key informants, including the dean, head of finance and administration, deputy dean of faculty, head of department, lecturers and accounting staff. While triangulation by data type performed through the use of interview result and documents such as financial report produced by the faculty, budget, Standard Operating Procedure (SOP) and internal audit report. All the data gives a better understanding of the main activities and provide sufficient information to decide the most appropriate cost drivers.

In detail, this study follows the steps in the study conduct by Cropper because it provides the details steps in implementing ABC [12].

IV. RESULTS AND DISCUSSION

The first stage of this research is the financial report analysis. Based on this report, the information regarding activity and cost structures can be collected. However, it does not give information regarding cost pools and cost drivers. Thus, information related to cost pools and cost drivers should be collected by performing an interview with the key informants.

A. Cost Pool

Two stages method is the most rational method in cost allocation [2,5,12]. The first stage is identifying activities and categorizing these costs into cost pools and the second stage is identifying the cost drivers.

An interview is performed to determine the cost pool for each activity. We interview the head of finance and administration, deputy dean of faculty and head of departments. Before the interview, all of the activities are listed and categorized to its structures based on the information in the financial report. After that, we ask the nature of each activity to determine the cost pool.

Questions replication is performed for each key informant. To increase reliability, the interview is performed individually at the different time. A model depicting this cost tracing is presented in table 1.

TABLE I. A MODEL DEPICTING THIS COST TRACING

Activity	Cost Structures	Cost Pools
Teaching including tutoring	Program cost	Academic cost
Practicum	Program cost	Academic cost
Short Semester	Program cost	Academic cost
Exams	Program cost	Academic cost - exams
Department Development	Program cost	Academic cost
Employee's health and wealth	Non-program Cost	General Administration
Administration	Program cost	General Administration
Non-Curricular Activity	Program cost	Non-Curricular activity
Non program activity	Non-program Cost	Non-program cost
Others	Non-program Cost	Non-program cost
Community Development	Program cost	Others – Nonclass
Lecture Development	Program cost	Others – Nonclass
Research	Program cost	Others – Nonclass
Students registration	Program cost	Student registration

B. Cost Structure

The cost structure in this faculty is divided by two, program cost and nonprogram cost. The program cost is cost related to *Tridharma Perguruan Tinggi* (teaching, research, community development) while the nonprogram cost is another cost that not mainly supported *Tridharma Perguruan Tinggi*.

1) *Program cost*: There are five categories in the Program Cost, which are:

- a) *Student registration*: This type of cost occurs every year. New students obliged to pay the registration fee.
- b) *Academic cost*: The academic cost is aimed to support in-class teaching activities. This cost is divided into six categorize, which are:
 - Teaching. Teaching costs vary including salaries, allowance, teaching fees, module fees, guest lecture fees, and counselling.
 - Exam. The exam cost consists of exam preparation and invigilator cost.
 - Department development. This cost reflecting the costs that occur in the department to accommodate academic activities. This cost including seminars, workshop, curriculum development, academic cooperation and accreditation.
 - Short semester. The short semester is a semester that held from June to August. Normally students take this semester to improve their GPA. The period is shorter than class activity in another semester. All of the costs that occur in the short semester is categorized as a short semester cost.
 - Practicum. In general, the practicum is a class where students practice the theories in class to practice.
 - Tutoring. In the final year, students obliged to do an internship and prepare its report. Moreover, students

should make a research and prepare a thesis. The costs related to internship and thesis preparation are categorized as tutoring cost.

c) *Others–nonclass*: The others nonclass cost occur to support non-class teaching activities. This cost is divided into three types:

- Lecture development
- Research and community development
- Others

d) *Non-curricular*: The noncurricular cost is intended to fund students' activity and alumni. This cost is divided into:

- Student cost
- Student and alumni development cost
- Student welfare cost

e) *General administration*: The general administration cost is aimed to support the teaching activities. There are eight types of cost under the general administration cost, which are:

- Routine cost occurs on a monthly basis. It reflects the cost that should be paid to employees including allowances, over time, and business trip. The amount of this cost can be predicted each month.
- Nonroutine cost. Similar to routine cost, nonroutine cost occurs on a monthly basis, however, the amount of this cost is varies each month.
- Employees development. Course and training are held to enhance the capability of employees. University also provides an allowance to employees who performed well. All of the costs related to those activities are categorized as employees development cost.
- Universities development.
- Relation and marketing.
- Maintenance. Maintenance cost is applied not only for the classroom and students facilities but also for operational vehicle
- Wealth and health. This cost consists of feist allowance, pension benefit, sport and art, leisure and religious activity.
- Others. Donation and tactical funds belongs to others category.

f) *Non-program cost*: This type of cost occurs periodically and categorized into:

- Bank administration and tax.
- Depreciation and amortization.
- Others.

C. Cost Driver and Cost Driver Rate

Based on the cost structure above, each activity is categorized and collected under cost pools. From the information gathered from interview with the dean, head of finance and administration, deputy dean of faculty, head of department, lecturers and accounting staff, cost drivers for each cost pools can be determined. While information related the cost driver rate is acquired from budget and financial report. The calculation can be seen in table 2.

TABLE II. COST DRIVERS AND COST DRIVER RATE

Activity	Cost Pools	Cost Drivers	Cost Driver Rate (in million rupiah)
Teaching including tutoring	Academic cost	Number of class	0.3
Practicum	Academic cost	Number of class	0.16
Short Semester	Academic cost	Number of class	0.4
Exams	Academic cost – exams	Number of course	0.8
Department Development	Academic cost	Number of class	0.05
Employee's health and wealth	General Administration	Number of employees	14.6
Administration	General Administration	Number of employees	28
Noncurricular Activity	Noncurricular Activity	Number of students	0.1
Non-program activity	Non-program cost	Number of students	0.38
Others	Non-program cost	Number of students	0.18
Community Development	Others – Nonclass	Number of lecture	0.47
Lecture Development	Others – Nonclass	Number of lecture	27
Research	Others – Nonclass	Number of lecture	12.2
Students registration	Student registration	Number of students	0.17

D. Tuition Fee Based on ABC

ABC model can be formed by multiplying the cost drivers rate with the number of performed activities. For tuition fee calculation purposes, the cost drivers rate is multiplied with budgeted activities. The calculation result shows that the current tuition fee is not sufficient to fund all of the activities in the faculty. Therefore, management needs to raise the tuition fee up to 15% to ensure that all of the activities working properly.

V. CONCLUSION

Our calculation shows that it is possible for universities to calculate more accurate tuition fees by using the ABC method. In this particular research, the ABC calculation shows that current tuition fee cannot support all of the activities in the faculty, thus, management should increase the fee up to 15% to maintain university standard. Our research shows that management should increase the fee up to 30% if management

wants to enhance its quality. But in practice, the result of this research can create impact only if academic managers agree to execute the result.

The ABC system is depends on its activity. Since each faculty is unique and has its own characteristic, thus we decide to calculate the tuition fee for one faculty. However, it would be interesting to repeat the process and calculate the optimized tuition fee in other faculties and compare the result of each faculty to decide the university's strategic decision.

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