

# Chapter 5

## Conclusion, Discussion, and Recommendations

This chapter concludes the Activity Based Costing methodology and its results, including the analysis of the results. The Activity Based Costing methodology will then be discussed concerning possible distortion of the results. Finally, some recommendations that are useful for further study and improving Activity Based Costing technique in future work will be raised.

### 5.1 Conclusion

The study of Activity Based Costing of the Project Management in the Construction of a 2,000 m<sup>3</sup> LPG Spherical Tank Project is aimed at applying Activity Based Costing to evaluate and analyse the cost of the project management of the construction Project. This study was performed as a pilot project that analyses the cost by Activity Based Costing technique.

The methodology of the Activity Based Costing technique in this study can be divided into five major steps. The first step is "analyse activity". In this step, activities will be analysed by the creation of the activity model. The IDEF0 modeling technique was selected to be used. By this technique, the major activities the interacting of these activities was defined. These activities were subdivided into subordinate activities, which will enhance detailed understanding and further define the work done to complete the task or process. Furthermore, in the activity model, the input, output, control, and mechanism of each activity will be identified. This information tells us that the activity is the transformation of inputs into outputs performed by mechanism under the controls or standard. The major activities of this project is defined as seven activities, namely: perform project planning & control, produce Basic Design & Scope of Work and TOR, perform bidding, perform contract work, supervise construction work, perform Hand-over work, and perform payment.

The second step is "Gather Cost". All of the available costs from various resources were captured. The categories of cost that are captured are Manpower cost, supplies, rental equipment, facilities and overhead expense. Using the ratio concept, all the pooled cost of the department was divided into the

project costs and they were divided again to allocate into the organisation elements. The ratio was scaled by interviewing the involved managers and personnel.

The third step is "Trace cost to activities". This step is the integrating of the results from first step and second step. The cost from the second step was allocated into all activities that are described in the first step. The organisation elements were identified into three categories - managerial, support, and operational. First the costs of support elements were redistributed into managerial elements and operational elements by ratio of support. Next, the managerial costs were allocated into operation element by the ratio of time allocation. Then, by the ratio of workload and time allocation, the cost of each operational element was divided and allocated into the activities and sub-activities that are listed level by level. Next, the cost of each activity is defined.

The fourth and fifth step is "Establish output measures" and "analyse cost" respectively. Output measures are established to analyse the activity output and performance in terms of cost per unit output and time consumed. Then, the output measures are evaluated and analysed together with activity costs. The analysis information for consideration of cost reduction and process improvement is then created. After that, the cost simulation is performed to show the results of the potential in advance commitment.

By applying the ABC modeling and cost simulation in this study, the total cost of the project management is expected to be reduced from 5,691,767 Baht to 4,226,748 Baht or reduce approximately 30%. The total time of this project is expected to be reduced by 8 months.

In conclusion, ABC modeling can help us identify the cost of each activity in the process or business. Cost analysis can help us identify cost reduction opportunities, communicate the learning associated with the improvement, and in general reinforce the entire improvement effort.

## **5.2 Discussion**

The discussion in various topics of this study is described as follows:

1. The result of the study may be distorted due to lack of information. This study began long after the project was started. Some required information that has no record cannot be captured. So, to capture this information, the estimated information from the interviewing of involved personnel is used instead.
2. The work process of the project management is quite different from manufacturing process. Most of the project management process is the once time activity. This means the activity is performed only once in this project, if an activity is already done and no one recorded data about it, it is impossible to capture its real information except the estimated data from the involved personnel.
3. The calculation for activity cost in any step may be distorted due to wrong ratio such as ratio of workload of operator or percentage of time allocation of managerial element.
4. One of the essential points of this study is the method that redistributes the cost of support elements and managerial elements into operational elements. This made the activity model not too complex. So, the cost of the operational elements that is allocated into each activity is not the pure operational cost. It contains the cost of the support element that supports the operational element for that activity plus the cost of the managerial element that manages the operational element do that activity. In business, the work of management level is managing of the work. The activity of management is not clearly seen in the workflow. If the activity model includes the activity of management level, the activity of the management level may be only signing the book for approval or joining the meeting. This leads to wrong calculation and made people question why the work of management level is so little but the cost of activity is so high.
5. In activity model developing process, it is suitable to perform this work by team formation because it has the benefit of brain storming that supported from various experiences and ideas. In this research, however, this was not done due to the time constraint.
6. In activity model developing process, the output of the process should be set first and then the activities and sub-activities developed to achieve this output. Again, in this research this was not done since both process and output are already known.

7. In this study, support cost is allocated not only based on time allocation, but also based on workload of each support element.
8. For easier analysis, the calculation of cost of studied project can be performed by separating the cost that directly incurs to the project (incremental cost) from the cost that pool with other projects.

### **5.3 Recommendations**

For further study, the following actions are recommended.

1. In further study, the study should be started at the beginning of the project in order that the study team can capture the information of the cost, percentage of workload or time allocation more correctly. So, the activity cost will be more accurate too. The correct activity cost can be used as the benchmark for other projects in the future.
2. The Activity Based Costing can be used as a tool for estimating the budget of the project. Then, the Activity Based Costing in that project is used and the budget estimated is compared with the real cost.
3. Output measures and cost analysis from each study of Activity Based Costing will aid in the continuous process improvement effort.
4. The Activity Based Costing simulation program should be developed for ease in calculation in future process improvement.