

Cost Accounting Teaching: Focus on the Processes and Operations

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Keywords: Cost accounting, Processes and operations, Cost elements, Cost allocation

Abstract. Lack of clear clue to organize a large amount of data to calculate product cost confuses accounting course teaching though many independent colleges emphasize more cost calculation skills than cost theories. This paper try to introduce process management into our cost accounting classroom. After a series of discussions on how to streamline the overall calculation framework, how to choose a specific method and how to get the final results by excel spreadsheet, an quantitative experimental analysis shows that teaching modality based on processes and operations performs more effectively than the traditional.

Introduction

Cost accounting is the precondition of profit calculation. All the pricing methods are based on exact cost information, such as the cost plus method, target profits method, psychological pricing method, etc. So, how to make students master the cost calculating skills is the main task in our classroom. Lack of clear clue to organize a large amount of data to calculate product cost confuses accounting course teaching though many independent colleges emphasize more cost calculation skills than cost theories. Noting that the process and operation of cost accounting is in line with the core ideas of process management [1], we try to introduce it into our cost accounting classroom in order to boost the quality of the course teaching. This paper will discuss how to depict an overall calculation framework, how to choose a specific method and how to get the final results by excel spreadsheets.

The Definition of Cost Accounting Process

Definition of business process. Business process is defined as the set of a series of structured measurable activities, and produce a specific output for a specific market or specific customer, which has six elements: inputs, activities, relationships of activities, outputs, customers, value [2]. We will divide the six elements into two levels: inputs, activities, activities relationships, and output elements are on behalf of the accounting technology level, customer and value elements are on behalf of the management level.

Cost accounting process. Standardized production is usually processized, cost data associated with production processes have their own collection and distribution rules. Cost accounting process should reflect the value-added flow in the production, which can be defined as: the structured value of consumed resources by the final products, its inputs are labor, materials, machinery with specific quantities and prices, its activities are the collection and distribution of the input value, the activities relationships are the quantitative combinations of different input value, its outputs are the cost of a variety of products.

The Cost Accounting Process

Choosing a complex manufacturing enterprise as our object, the unit product cost is the result of the collection and distribution of all the cost factors artificially.

Overall process. According to cognitive psychology, understanding is closely related to construction [3]. A cost accounting flow chart can help students to construct a more intuitive thinking framework, further the internal processes of some details in each layer. In fig. 1, each arrow between different boxes expresses the direction of value flow. Value flows between the layers are complicated because there may be multiple basic or auxiliary workshops, a variety of basic or auxiliary outputs. We use the number I, II, III, IV represent the distribution of the value transfer, then the choice of the specific distribution method becomes a new discussion focus in classroom teaching.

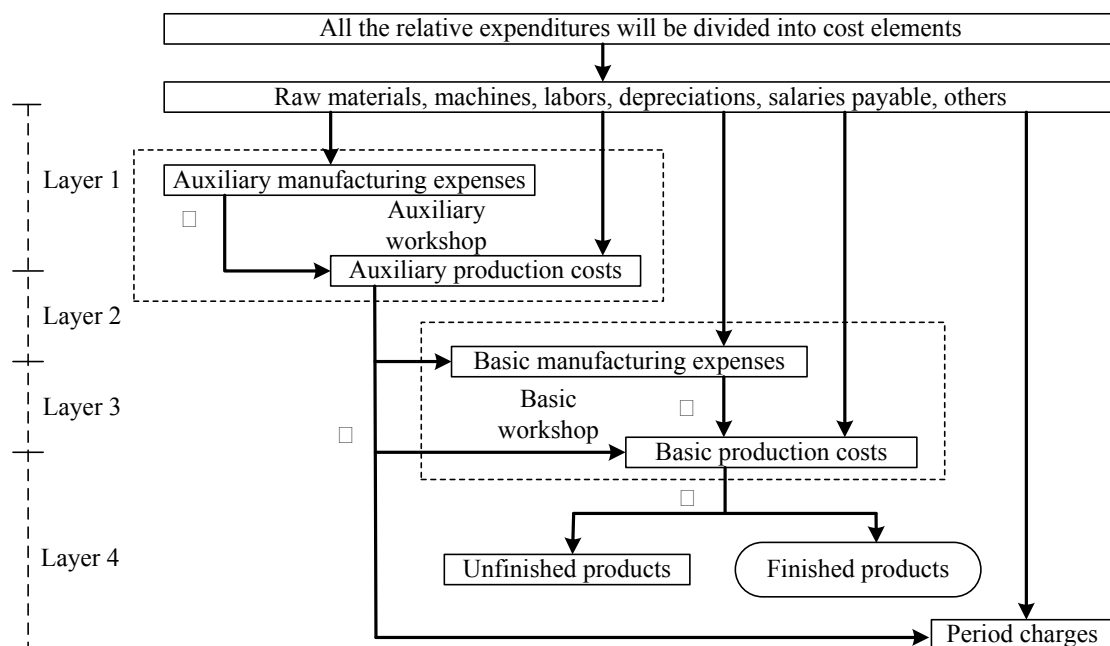


Fig.1 Flow chart of the overall process

The choice of process I and III. The distribution criteria of I and III are very similar, which can be chosen by the correlation of product attributes, such as weight, volume, yield or output value and so on, or chosen by the consumption levels, such as labor /machine hours, materials quantities, etc., or chosen by the quotas.

The choice of process II. The auxiliary production costs can be distributed by using many approaches, which should be matched with the production features, shown as table 1.

Table 1 Method choice of auxiliary production costs allocation

Allocation methods	Descriptions of production characteristics
Direct allocation	Few auxiliary production services provided between each other
Reciprocal allocation	Many production services provided between auxiliary workshops
Planning cost distribution	Have plan costs with accuracy
Algebraical distribution	Many auxiliary production departments and unknown variables
Sequence allocating	Reciprocal services with obvious order between several auxiliary production departments

The choice of process IV. By the end of every month, in order to allocate all the costs between the unfinished and the finished products, we can adopt different methods based on different assumptions to deal with the former. The calibration methods of the unfinished products and production features are matched in table 2.

Table 2 Calculation method of unfinished products

Calculation method	Descriptions of production characteristics
Excluding	The number of unfinished products are small, stable and cheap
Assume as fixed	The number of unfinished products fluctuates slightly between months, and has little value proportion to the completed products
Equivalent units	The number of unfinished products waves heavily between months, and has highvalue proportion to the completed products,factors such as raw materials and labor cost, etc. can be adopted as standards for equivalence
Assume as finished	Unfinished products which is nearly completed
Adopt the norm cost	The quantities of products in processarestable and the quota is accurate

Calculation Process Design by Using Excel Spreadsheets

Cost accounting is difficult to standardization because of the highly personalities for different enterprises. In terms of a specific company, we can analyze its production characteristics, adopt appropriate cost accounting methods and guide the student to compute the product costs by using excel spreadsheets. The whole calculation process design may note the following points.

- 1) According to fig. 1, in order to facilitate the data store and access between sheets, each layer should have at least one excel file with multiple sheets.
- 2) For the sake of convenience for metadata maintenance, function calculation and access, it is recommended to input the original data according to the rule of one variable one column without merged cells in sheet1, which can be renamed for easily recognition.
- 3) Pursuant to the requirements of the actual production and the allocation methods of the process I , II , III, IV , design separate sheet.
- 4) Define the functional operation relationships within different sheets or between different excel files.
- 5) After metadata filled, other needed processestables will be calculated automatically.If there are calculation errors, students should review and correct the raw data and the function relationships, and then, the calculation result will real time renewed.

Cost Accounting Implications: Discussion for Management

Students should grasp not only the accounting frameworks and skills, but also understand its management implications from the factors of customer and value in ourclassroom teaching.Considering the teaching aims of independent colleges, teachersshould organize some qualitative casediscussions to help them catch the implications of cost accounting for management. So, the linkage betweenabstract numbers and practical significance will make the students understand how the management decisions are supported by the cost data [4].

Performance Comparison: Processes and Operations Guided vs Traditional Modalities

Quantitative research design. In order to test whether teaching modality based on processes and operations are more effective than the traditional modality dominated by cost theories and manual calculations, we chose 112volunteers majoring in accounting, who were divided randomly into an experimental class and a reference class with respective 56 subjects coached by the same teacher. The experimental class was taught by processes and operations guided teaching modality and the reference traditional modality. At the end of the semester in January 2014, a

case including relative cost analysis and computation, manual or by excel, was designed to identify whether the effect of the two modalities have statistical significance.

Quantitative results and discussion. “Grade_exp” means average scores of the experimental group, while “Grade_ref” means average scores of the reference group. We present the descriptive statistics and t-test results in the following tables.

Table3 Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Grade_exp	56	86.34	10.94	44	100
Grade_ref	56	76.88	11.75	44	95

Table4T-test result of the two teaching modalities

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.Interval]	
Grade_exp	56	86.34	1.46	10.94	81.95	86.09
Grade_ref	56	76.88	1.57	11.75	65.12	70.12
diff	56	9.46	2.11	15.80	3.20	9.60

Mean (diff) = mean (Grade_exp - Grade_ref)

t = 4.4826

Ho: mean (diff) = 0

degrees of freedom = 55

Ha: mean (diff) < 0

Ha: mean (diff) != 0

Ha: mean (diff) > 0

Pr (T < t) = 1.0000

Pr (|T| > |t|) = 0.0000

Pr (T > t) = 0.0000

d = MD/Pooled SD = $9.46 / ((10.94 + 11.75) / 2) = 0.834$

Table 4 indicates that teaching modality based on processes and operations are better than the traditional modality dominated by cost theories and manual calculations. The difference between the two modalities is significant, $t(55) = 4.4826$, $p < 0.05$. Cohen coefficient 0.834 indicated a large effect size [5].

Conclusions

Independent colleges emphasize more cost calculation skills than cost theories. We introduced the core ideas of process management into cost accounting classroom in order to clarify the clue of how to organize a large amount of data to calculate product cost. Overall process, methods selection process, calculation process by using excel, etc. have been discussed. And then, a quantitative research demonstrated that teaching modality based on processes and operations is more effective than the traditional and the students reported more involvements and satisfactions. So, the qualities of cost accounting is boosted by the processes and operations guided modality.

References

- [1] Yurong Wang, Xinhong Ge, Process revolution 2.0-Root the Strategy through Process Management. Peking University Press, Beijing, 2011.
- [2] Thomas H. Davenport, Process Innovation-Reengineering Work through Information Technology, Harvard Business School Press, 1993.
- [3] Robert J. Sternberg. Cognitive Psychology, third ed., Thomson/Wadsworth, Australia, 2003.
- [4] Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan. Cost accounting: a managerial emphasis, 14th ed., Pearson Prentice Hall, New Jersey, 2012.
- [5] Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Lawrence Erlbaum Associates.