Research on the Cost Accounting under the Transformation of Manufacturing Industry

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Abstract: With the development of artificial intelligence and high and new technology, China's manufacturing enterprises are facing the development pressure of transformation. Promoting supply-side structural reform and improving innovation capacity are common problems facing manufacturing enterprises. Under such background, accounting as an important decision-making department of the company, also needs to adjust the way of cost accounting to adapt to the development trend. From the perspective of accounting, this paper proposes three new cost accounting methods, namely Activity Based Costing, Life Cycle Costing and Target Costing. This paper first explains the definition of these three cost accounting methods, algorithm steps. And we use specific data to elaborate the algorithm. Finally we analyze the advantages of these three methods and their role in promoting the transformation of manufacturing enterprises.

1. Introduction

Along with the mechanization degree unceasing enhancement and the artificial intelligence unceasing development, manufacturing companies' production of products increasingly efficient. However, at the same time, the cost ratio of each factor of production is also changing. Traditional manufacturing costs are dominated by direct labor and direct material, while the proportion of direct labor and direct materials in the new manufacturing industry will be greatly reduced under the promotion of artificial intelligence. At the same time, the new manufacturing industry will be supported by innovation and technology, and adopt more sophisticated production mode to produce better quality products in line with market requirements. Under such industrial transformation, the methods of cost accounting should also be adjusted and innovated to meet the needs of the times.

2. Organization of the Text

2.1 The Introduction of Activity Based Costing

Production cost is divided into four parts, namely direct material, direct labor, direct expenses and production overheads. Direct material, direct labor and direct expenses belong to variable direct cost which could be allocated to each unit product. It is difficult to allocate production overheads, as it is used by the whole products and serviced in the whole production process. Traditionally, we use absorption costing to allocate and calculate the production overheads costs. Absorption costing calculation is based on the formula that is production overheads costs=OAR*actual activity level. The OAR =Budget overhead/Budget activity level. And activity levels are usually determined by two factors that are labor hours for production and machine hours for production. Which method is ultimately selected depends on the degree of correlation between cost drivers and labor or machines. Through having a basic understanding of Absorption Costing, we could find that traditional absorption costing was developed in a time when most manufacturers produced only a narrow range of products, so that products underwent similar operations and consumed similar proportions of

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overheads. In addition, overhead costs were only a very small fraction of total production costs: direct labor and direct material costs accounted for the largest proportion of the costs.

Based on the development trend, we introduce Activity Based Costing to allocate production overhead cost. The steps of ABC are shown below.

Step1: Allocate overhead to cost pools according to activities incurred.

Step2: Identify what influences the cost of a specific activity, i.e. cost driver. Then find out no. of cost drivers.

Step3: Cost driver rate =$ overhead/No. of drivers

Step4: Share overhead; And calculate Unit cost.

Take a specific company as an example. A company manufactures two products, C and D, for which the following information is available:

Table 1 The details of cost

	Product C	Product D	Total
Budgeted production(units)	1000	4000	5000
Labor hours per unit/in total	8	10	48000
Number of production runs required	13	15	28
Number of inspections during productin	5	3	8
Total production set up costs			$140000
Total inspection costs			$80000
Other overhead costs			$96000
Other overhead costs are absorbed on the basis of labor hours per unit			

Through calculating the budgeted overhead cost per unit of product D, we learn to apply ABC. Set-up costs per production run=$14000/28=$5000; Cost per inspection=$80000/8=10000; Other overhead costs per labor hour=$96000/48000=$2. Overheads costs of product D:

Setup cost: 15*$5000/4000=18.75.

Inspection costs: 3*$10000/4000=7.5

Other overheads: 10*$2=20

Total cost: $46.25

According to the above discussion, we could conclude that the biggest difference is that the activity level used by AC is related to production and the activity level used by ABC is related to transaction not production. So under AC mode, the longer the time consumption is, the more OH is allocated to the product. And the larger the production quantity is, the more production overheads is allocated to the product. Under the ABC method, the more complex the process, the better the technological content, and the more steps, the more production overheads the products share. Therefore, ABC method is more suitable for the current development trend of the manufacturing industry: Influenced by artificial intelligence, the proportion of labor cost in the total cost is decreasing and only products with high technological content and strong innovation can meet the market demand. For a traditional manufacturing enterprise which would like to succeed in transformation, the accounting method of cost accounting should also be changed to reasonably price its products. This conclusion is discussed in detail below.

First, the complexity of manufacturing has increased, with wider product ranges, shorter product life cycles and more complex production processes. ABC recognizes this complexity with its multiple cost drivers, therefore, more accurate for cost, price and decision making. Second, in a more competitive environment, companies must be able to assess product profitability realistically. ABC facilitates a good understanding of what drives overhead costs and for better cost control. Third, in modern manufacturing systems, overhead functions include a lot of non-factory floor activities such as product design, quality control, production planning and customer services. ABC is concerned with all overhead costs and so it can take management accounting beyond its “traditional’’ factory floor boundaries.

2.2 The introduction of Life Cycle Costing

Life-cycle costing is the profile of cost over a product's life, including the pre-production stage. It tracks and accumulates costs and revenues attributable to each product over the entire life cycle that could be divided into development stage, introductory stage, growth stage, maturity stage and decline stage. This approach covers all costs, such as R&D costs (design costs, testing costs), training costs, production costs, inventory cost (holding spare parts, warehousing), marketing costing and withdrawal costs (retirement and disposal).

Take a specific company as an example. The following information relates to the expected cost of a new product over its expected three-year life.

Table 2 The details of a new product' whole cost

	Year 0	Year 1	Year 2	Year 3
Units made and sold		25000	100000	75000
R&D costs	$850000	$90000		
Production costs				
Variable per unit		$30	$25	$20
Fixed costs		$500000	$500000	$500000
Selling and distribution costs				
Variable per unit		$6	$5	$4
Fixed costs		$700000	$700000	$700000
Customer service costs				
Variable per unit		$4	$3	$2

According to the figure 2, we could calculate the expected average life cycle costs per unit.

Variable costs: Year 1:$(30+6+4)*25000=1000000; Year 2; $(25+5+3)*100000=3300000;

Year 3=$(20+4+2)*75000=1950000

R&D costs=940000; Other fixed costs=3000000;

Total life cycle cost=1000000+3300000+1950000+3000000=10190000.

Average life cycle cost per unit=10190000/200000=0.95

If manufacturing enterprises want to transform successfully, they must improve their innovation and research and development capabilities. Therefore, it is very important to choose the right project to maximize the long-term benefits. As a result, the LCC method is very suitable for evaluating and pricing investment projects. This conclusion is discussed in detail below.

First, it helps management to assess profitability over the full life of a product, which in turn helps management to decide whether to develop the product or to continue making the product. Second, it can be very useful for organizations that continually develop products with a relatively short life, where it may be possible to estimate sales volumes and prices with reasonable accuracy. Third, better decisions should follow from a more accurate and realistic assessment of revenues and costs. Fourth, the relationship between different cost areas is highlighted, resulting in earlier actions to generate more revenue or to lower costs. Finally, it reinforces the importance of tight control over lock-in costs at different stages, such as R&D in the development stage.

From the perspective of using LCC method, we can put forward four directions for manufacturing transformation to maximize profits. They are designing costs out of products, minimizing the time to market, minimizing the breakeven time and maximizing the length of the life span.

2.3 The introduction of Target Costing

Traditional cost looks at what a product does cost. By using cost-plus pricing model it gives an anticipated profit margin. Target costing involves setting a target cost by subtracting a desired profit margin from a target selling price. It aims to continuously look at product costs under certain competitive price.

The steps of target costing is below. First, determine a product specification. Second, decide a market sales price. Third, estimate the required profit. Then, target cost=market sales price-target

profit. In addition, determine estimated cost. So, target cost gap=estimated cost-target cost. Finally, we focus on how to close the target cost gap.

Take a specific company as an example. A company is in the process of introducing a new game to the market and has undertaken market research to find out about customers' views on the value of the product. The results of this research have been used to establish a target selling price of $ 60. Cost estimates have been prepared based on the proposed product specification.

Table 3 cost estimates

Manufacturing cost	$
Direct material	3.21
Direct labor	24.03
Direct machinery costs	1.12
Ordering and receiving	0.23
Quality assurance	4.6
Non-manufacturing costs	
Marketing	8.15
Distribution	3.25
After-sales service	1.3
The target profit margin for the game is 30% of the target selling price.	

Calculation solution:

Target selling price=60; Target profit margin (30%): 60*30%=18;

Target cost: 60-18=42; Projected cost: 3.21+24.03+1.12+0.23+4.6+8.15+3.25+1.3=45.89;

Gap: 45.89-42=3.89.

We now introduce the philosophy of target costing. The objective cost method believes that the successful product should find a way to lock the cost in the design process, rather than find a way to reduce the cost in the production process. Generally speaking, the company solves the cost difference before production, so the target cost method emphasizes pipeline in advance, cost management and production and sales first, rather than cost control in the subsequent production process. While the traditional way is usually to manage the production link when the cost is too high.

Target costing emphasizes that the product should be developed in an atmosphere of continuous improvement using value engineering techniques and close collaboration with suppliers to enhance the product(in terms of service, quality, durability and so on) and reduce costs.

This idea is in line with China's thought of vigorously promoting the supply-side structural reform of manufacturing enterprises, an effective guide to the development of China's manufacturing industry towards refinement. It is a strong reference.

3. Conclusion

Activity Based Costing, Life Cycle Costing and Target Costing have improved the traditional cost accounting method reasonably and effectively. At the same time, the algorithm is simple and easy to understand, with a strong operability. More importantly, their advantages can promote the transformation and development of manufacturing enterprises, helping enterprises cultivate the spirit of innovation and l costs control and making enterprises develop products in line with market demand. This paper argues that these three methods have strong generalization significance.

At the same time, these three methods alone are far from enough. We still need to continue to explore the reform of cost accounting methods to promote the transformation and development of manufacturing enterprises.

References

[1] Zhang Wuxing. Study on the construction of operational environmental cost accounting system in coal enterprises [J]. Coal engineering, 2019, (10): 5-10

[2] Wang Lihua. Analysis of the application of approximate output in cost accounting and planning [J]. China's collective economy, 2019, (10): 27-35

[3] Zhou Lingqing. The main problems and countermeasures of cost management in commercial enterprises [J]. The Chinese market, 2019, (10): 4-7

[4] Hui Wang. Application of standard cost method in enterprise cost management [J]. Accounting study, 2019, (10): 5-8

[5] Gao Jianping. On manufacturing accounting cost accounting and management of small and medium-sized enterprises [J]. The finance, 2019, (10): 22-33