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CASE REPORT

Application of Management Accounting in Company Sustainability

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ABSTRACT

This report illustrates how management accounting can be used in helping an organization reach sustainability by applying four main tools in management accounting to a dairy company. These tools are Life-Cycle Analysis, Identification of Relevant Costs, Activity-Based Costing (ABC) System and Balancing Score Card, all of which can help qualify and consequently quantify the various costs (including environmental costs) incurred during the operation of a company. Besides that, the above tools can also be utilised in a company's decision-making processes by the man-agement team. Thus, it is suggested that companies integrate these tools into their reporting system. This report illustrates the definition of a sustainable organization in the beginning, followed by detailed descriptions of the four management accounting tools, together with their applications to a diary company. The report ends with a summary on which type of role each tool plays in the re-porting system.

1. Introduction

Sustainability is a frequently mentioned word in the business environment nowadays. People are worried about this issue because the population keeps growing at a very fast pace and the consumption of natural resources has been skyrocketing, while the earth is a limited place. Therefore, in order not to leave our future generation a dreadful planet to live, we need to pay attention to the issue of sustainability so that the natural resources will be sufficient across every generation [1].

To make that happen, organizations have to make changes so that they can maximize their services and products with a given amount of resources, or minimize their resources used when providing the same level of products or services [2].

But in the meantime, organizations must not sacrifice too much since the existence of businesses is value creation and earning a profit. If companies are solely cutting their production for the purpose of environmental sustainability at the cost of making a loss, then such companies will go bankrupt very soon, resulting in a serious consequence of unemployment and economic recession.

Hence, we must define what is a sustainable organization, which is shown in Figure 1.

A sustainable organization must be profitable over the long run and generate an acceptable return for its shareholders to be economically sustainable. Socially, this

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organization must provide products and services that can be consumed by and add value to the clients in exchange for its revenue. In addition, this organization must provide employment opportunities for the society to uphold the organization's operation and to support the society's public stability. Lastly, during the daily operation, this organization must constantly improve its efficiency and reduce its pollution to become environmentally sustainable [3].

However, to improve an organization's sustainability, the management must know how to measure sustainability first. In other words, the transition from qualitative to quantitative factors. To achieve this purpose, management accounting serves as an indispensable tool for sustainability measurement.

Figure 2 shows the four main functions of management accounting that can assist.

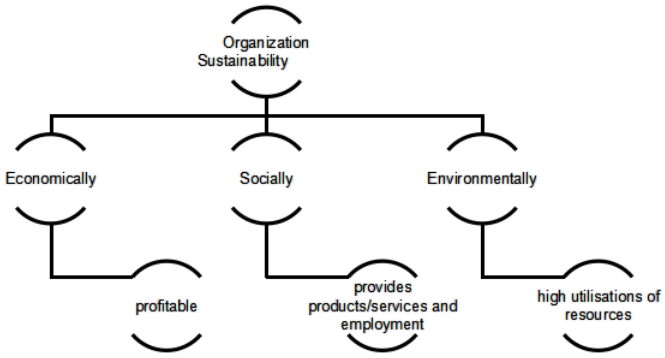

Figure 1. Components of organization sustainability

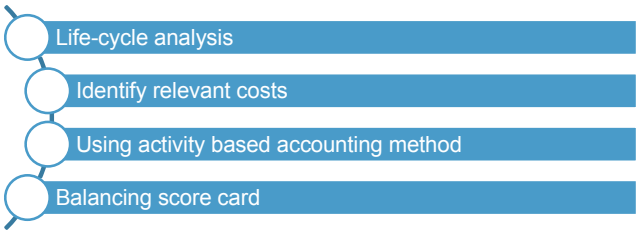

Figure 2. Four major functions of management accounting in assisting organization sustainability

2. Life-cycle Analysis

The life-cycle analysis can give us a clear picture of our company's overall activities. Moreover, it can help us identify the costs and benefits that can be incurred in each process and activity, which is also the second main function of management accounting [4].

As a management accountant working in the dairy industry, I will begin with a life-cycle analysis, which is illustrated in Figure 3, to identify what are the activities that our company has.

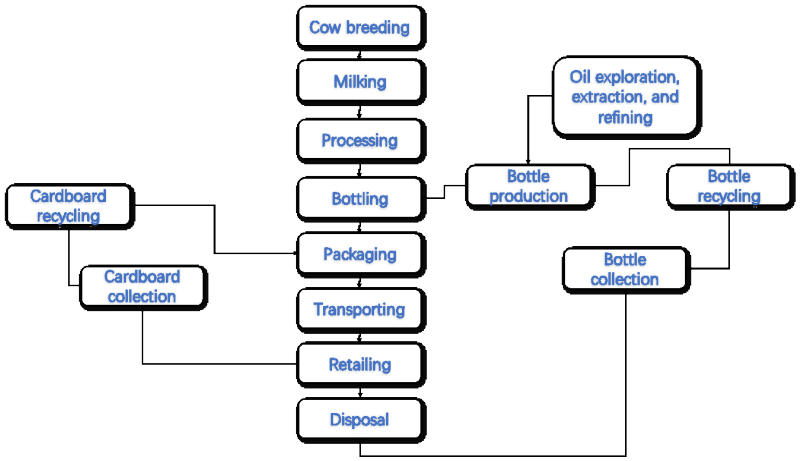

Figure 3. Life-cycle analysis of a dairy company

3. Identify Relevant Costs

After the life-cycle analysis of our company, we can now start to identify the relevant costs (mainly environmentally related costs) involved.

1) Cow breeding: The energy required for a milking cow is almost 4 to 7 times as much as it needs for maintenance. The excess nitrogen and potassium in forage can result in water contamination.

2) Milking: Milking machines and labor are required in this process. Thus, the electricity expense is the major cost as the machine has to keep running, and the labors need to manage the cows before and after they are milked.

3) Processing: A set of chemical and physical treatment is added to the raw milk, including disinfection, pasteurization, and separation before going further to the production of drinking milk, cheese, butter, or powder.

4) Bottling: A large amount of plastics is consumed in this process as bottles of the milk. The production of bottles requires the oil exploration, extraction and refining, which costs a great deal of energy and may cause pollution.

5) Packaging: Paper is the major raw material since every batch of products is stored in thick paper boxes. This process consumes a massive number of cardboard which are derived from plantation, deforestation and wood processing. All these activities might create noise and may damage the environment.

6) Transporting: Dairy products must be transported under low temperature to prevent spoilage. Hence, additional fuel expenses will be incurred to generate electricity for the low-temperature fridge on transporting vehicles.

7) & 8) Retail and disposal: After delivery and consumption of our dairy products, used cardboard and bottles become the main waste, which can be collected and recycled to reduce extra resources consumption.

Hence, to become a more sustainable company, we can focus on reducing the above environmental costs incurred during the life cycle of our business.

4. Using Activity-based Accounting Method

As a manufacturing company, our company's major costs involve direct materials, direct labors, and other manufacturing overhead cost. Both direct materials and labors are relatively easy to assign to our products as long as we can calculate the number of materials and labor hours used in each product line. In contrast, overhead costs are difficult to assign since these costs cannot be traced directly to our products. For instance, electricity expense of the processing factory is such an overhead cost that is hard to allocate. Traditionally, people would allocate this electricity expense evenly across different product lines. However, this method may cause the misleading cost allocation if milk powder requires much longer machine hours to produce, which consequently consumes more electricity than other products.

Therefore, to eliminate this erroneous overhead costs allocation, the method of activity-based costing (ABC) system can be utilized in our company. Instead of allocating this electricity expense evenly across different product lines, ABC system uses the drivers of the activities which give rise to the overhead costs as the basis of overhead cost allocation [5]. In the case of electricity expense, the underlying activity is the operating of a machine, and the cost driver of machine operation is the machine hours. Thus, we can allocate our electricity expense to different product lines depending on the machine hours they consume respectively.

According to this ABC system, our company's overhead cost pools and relevant cost drivers can be elaborated as follows in Table 1:

After obtaining the OH cost/driver, we can then multiply these unit OH costs by the number of units respectively, which can give us the following cost allocation in Table 2:

Table 1. Overhead costs and cost driving activities

Budgeted activities	Drinking milk	Butter	Cheese	Powder	Budgeted total OH cost	$	OH cost / driver
Feeding hours	82	56	77	8	Hay, grain & roughage	91,235	411
Watering hours	81	60	55	47	Water	632,214	2601
Number of fertilisation	69	59	57	73	Fertilizer	526,832	2045
Herding hours	80	8	4	5	Herding	701,540	7307
Number of vet visits	2	52	17	10	Vet & medicine	783,595	9714
Machine hours	12	5	75	70	Machine maintenance & depreciation	596,260	3669
Kilometers of delivery required	61	33	77	72	Delivery cost	12,987	53
Inspection hours	15	76	6	63	Quality control	20,967	131
Number of calls	78	49	92	8	Customer support	822,594	3631
Treating hours	17	55	26	1	Chemical treatment	373,575	3776
Treating hours	51	2	84	40	Physical treatment	138,101	778
Bottling machine hours	53	56	2	88	Bottling	902,281	4521
Packaging machine hours	56	96	88	11	Packaging	866,441	3459

Table 2. Allocation of overhead costs to different products based on ABC system

Budgeted total OH cost	Drinking milk	Butter	Cheese	Powder	Total
Hay, grain & roughage	33510	22833	31683	3209	91235
Water	211025	155776	144053	121359	632214
Fertilizer	140567	120728	116196	149341	526832
Herding	585972	54813	26350	34405	701540
Vet & medicine	23544	507184	160422	92445	783595
Machine maintenance & depreciation	44007	18489	276245	257519	596260
Delivery cost	3275	1753	4093	3866	12987
Quality control	1993	9965	734	8276	20967
Customer support	282956	176520	334340	28778	822594
Chemical treatment	64296	208440	97278	3561	373575
Physical treatment	39360	1841	65555	31345	138101
Bottling	240468	254779	10299	396734	902281
Packaging	193970	331045	303216	38210	866441

ABC system not only gives us a more accurate result regarding indirect costs allocation, but also helps the top management make decisions as to whether they can reduce certain activities that drive the costs to reach cost efficiency as well as environmental sustainability [6].

5. Balancing Scorecard

Now that the breakdown of overhead costs has been accomplished, and the cost structure for each product line can be illustrated clearly, top management may need to step in and make decisions around how to improve its status quo and become more sustainable.

A balancing scorecard is a superb tool in helping the top management with their strategy and decision-making [7].

To reach the financial target and create more wealth for our shareholders, our company must occupy more market share in the industry. So consequently, customer satisfaction becomes our company's priority. However, modern consumers are quite different to their counterparties decades ago. Nowadays, consumers care more about the quality of the products and the reputation of the brand, instead of only concentrating on the price. Hence, according to the balancing score card in Figure 4, our company could take the following steps to strengthen product quality and reputation:

1) Improve the employee' satisfaction first through employee suggestions, employee training, and employee safety and health as these activities will eventually push up employee productivity, which can, in turn, improve the product quality and its production cost reduction.

2) Control chemical usage in the internal process since the quantity of the chemicals can undermine the quality of our products.

3) Improve energy, water, and material efficiency through process monitoring and waste recycling. Such improvements can help reduce the relevant costs, and subsequently, demonstrate the image of a sustainable company to our consumers.

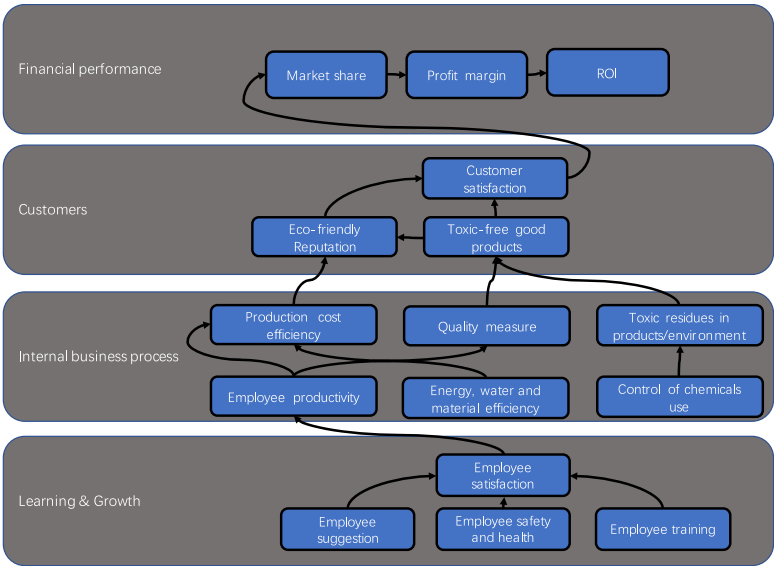

Figure 4. An example of the balancing scorecard of a diary company

6. Conclusions

To sum up, both life-cycle analysis and relevant costs identification enable the top management to qualify the various costs (including environmental costs) that may be incurred across the operation of our company. And the ABC system compliments life-cycle analysis and relevant costs identification by further quantifying those costs, which can provide the top management with detailed information. Finally comes the balancing scorecard, which can help the top management with strategy and decision-making to pursue a sustainable organization after the detailed information is available. Hence, it is strongly recommended that our company adopts these management accounting tools in our reporting system as they are beneficial to our company sustainability.

Conflict of Interest

There is no conflict of interest.

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