THE HIDDEN COSTS OF QUALITY AND ACCOUNTING METHOD

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Abstract

This Paper is to describe about new concept of the hidden cost of quality and through two cases plastic bottle manufacturing to explain how to find out it.

Generally, the hidden quality cost does not show in the accounting record, but some time can find in the data of cost accounting or management accounting.

How to combine between the hidden quality cost and the accounting method is discussed in the conclusion.

1. Introduction

Quality control is important in the modern management. Any enterprise can used quality control to improve its quality. Traditional, the cost of quality did not emphasis in the quality control field. But now, the cost of quality not only can improve quality but also can help decision Making.

The quality costs development can separate to three periods. There are "auxiliary sales cost period" "outstanding period" and "hidden period"[Su,1995]. Because high technique and managerial improvement(TQM) could reduce the cost of quality to minimize cost in the outstanding period, the modern concepts in the quality improvement have to gave attention in the hidden cost of quality in the hidden period.

In the accounting field, the cost accounting did not included the cost of quality in the traditional system, but now, the quality coats can find in the cost accounting [Horngreen, Foster and Datar,1994].

This paper will discuss two topics. Firstly, to find the hidden cost of quality from the modern information system. Secondly, to study the hidden cost of quality in the accounting methods.

2. The hidden cost of Quality

The cost of quality report prepared by the department of quality control. It did not checked by the other department. It almost did the data analysis only. But it prepared by the accounting department or cost department and checked by the quality control department in the latter of this period. The cost of quality control was used in many quality fields. Especially, it shown the effects of the "V" mask control chart[Su,1979, 1980, 1994 and 1995].

Some literature had point out about the hidden cost of quality. The hidden cost of quality is not included in the normal cost of quality mode[Duncan,1974]. If cost of quality is include the hidden cost of quality then the effect would be to move the optimum toward 100 percent conformance[Atkinson, Hohner, Mundt, Troxel and Winchell,1991]. Even the Formula of hidden cost of quality was showing[Chung,1996]. Four type of hidden cost of quality was described by Su[1995]. Su used 2 by 2 matrix to shown it. The matrix is as follow:

Model

Predictive	Model	Non-model
Predictive	V	V
Non-Predictive		V

It can find that it had not the non-predictive model. But it may have other three types. In the non-model cases, the data may come from subjective design or from the actual happen. Usually, the predictive model is using, and predictive methods of quality cost can use in this field. The certain model is easy than uncertain model to design. In the uncertain model, the most predictive methods are the estimation by Markov chain[Cyert, Davidson and Thompson,1967] and theory of information[Su,1995] and the input-output table[Su,1995].

The following two case are the types of theory of information.

A). Simple case- plastic bottle manufacturing

A small factory, plastic bottle maker, making one size and one specifications plastic bottle. The manufacturing process is as follow:

Input	Machine	Output	Product(set)
Plastic Material	T	Top	⎤
Plastic Material	B	Bottle	⎦ Assemble
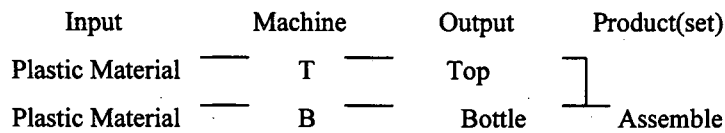
Factory get order from a customer A, and the lot of this time is 12,000 sets.

Because of Machine-T is broken. The factory use OEM system to make tops.

If cost of OEM is higher than the cost of manufacturing in factory(MIF) then have the hidden cost of quality. The hidden quality cost is include the differential cost between OEM and MIF, and the adjust cost that is from the extra(repair cost, part ...)deduce saving cost(Power, Labor ...). It can find that formula of hidden quality cost is as follow:

The hidden quality cost = (Per OEM price - Per MIF price) x Quantities

$$+\text{Adjust cost}$$
$$=(1.02 - 1.00) \times 12,000 + 100$$
$$=340$$

B). Complex Case-Same Factory

If this factory have two sets of machine, and the best of each set is as follow:

Set A   Top-machine(TA) + Bottle-machine(BA)

Set B   Top-machine(TB) + Bottle-machine(BB)

Because the tops and bottles can separate from each machine when in manufacturing.

So the factory a per unit cost of completed set matrix is as follow:

	TA	TB
BA	1.00	1.03
BB	1.02	1.01

It can transfer to a loss of pay-off Matrix that is as follow:

	TA	TB
BA	0	3
BB	1	0

The result of theory of game is as follow:

	Prob.	TA 1/4	TB 3/4	
BA	1/2	0	3	The expect extra loss
BB	1/2	1	0	is 3/4 per unit.

Now, because Machine-TA broken down, all 12,000 of tops need

make by Machine-TB and each bottle-machine make 6,000 of bottles.

The result of actualize extra loss is as following matrix:

	Prob.	TA 0	TB 1	
BA	1/2	0	3	The Actualize extra loss
BB	1/2	1	0	is 3/4 per unit.

The hidden quality cost is includes the extra actual loss and the adjust

cost. The amount is 190(=90+100).

3. Accounting Method

Accounting process is record ant transaction and prepare financial report. In the accounting concept, a transaction may from predict or estimation but is limit that the amount is certainly. But some time use intangible liability to show the uncertain item. For example, the quality assurance is use in the after goods sold[Chun,1998]. Although all hidden cost of quality does not show in the general accounting but some time can pass through the cost accounting or management accounting to do it well. Almost of the hidden quality of cost that if can predict or estimation then will be find in the accounting data. For example, the above two case, usually, it is belong in to the cost accounting data. The difficult is how to find that is in the Non-Model.

If the hidden quality cost need show in the accounting reporting then extend the accounting method of intangible liability may be a feasible method.

4. Conclusion

The hidden cost of quality is "the bulk of cost and below the surface and usually are responsible for

'sinking the ship' "[Atkinson, Hohner, Troxel and Winchell,1991]. It is difficult to show out in the any time, but it may give a big loss when it is happen. It was found many examples that was not only on money but also relate to guilty event [Bodnar and Hopwood,1993].

It is important that any enterprise must give more attention in the hidden cost of quality. The modern management concept does not do quality control only. How to find the hidden quality cost is the object of the quality control.

In this paper, It is just a start. It give the more clear concept about the hidden cost of quality, and give two examples to explain where is it, and note out that how to consider from accounting concept.

The study of hidden cost of quality will be continuous, and will be find more actual case in the nearly future.

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