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COST REDUCTION BY USING BUDGETING VIA THE KAIZEN METHOD

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Abstract

In the current conditions, continuous improvement is one of the main issues faced by the managers of organizations. The Japanese use the term kaizen to designate continuous improvement. Budgeting via the kaizen method explicitly integrates improvement throughout the period budgeted in the budget data.

Budget explanation via the kaizen method refers, on the one hand, to budgeting for the purposes of continuously improving the number of work hours per product unit, and, on the other hand, to the way it is used in cost management, or, more specifically, to the way it is used for the purposes of reducing costs.

Key words: kaizen, budgeting process, target cost, product life cycle, continuous cost reduction.
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Organizations are subjected to a continuous pressure in order to reduce the cost of the products or services they trade. It is extremely useful to understand the tasks or activities (such as the assembly and calibration of equipment or product distribution) that lead to the appearance of costs in order to calculate and manage the product costs. For the purposes of establishing the cost reduction objectives, managers start by "scanning" the market in order to determine the prices that the customers are willing to pay for certain products or services (these prices are considered target-prices and are fixed at a level that will enable the company to get the desired market segment and the proposed sales volume). In order to reach the target cost, the managers deduct from this target price a profit margin corresponding to the operation cycle that they expect to obtain throughout the entire lifecycle of the product or service. Then, the managers try to obtain the target cost by eliminating certain activities (such as product reconditioning) and the reduction of the costs for the execution of activities [Horngren, Datar, Foster, 2006, p. 13]

All these work stages are applied by the managers for all the functions of the value chain and for the entire lifecycle of a product or service, from the initial design until the moment the customers no longer receive services for the respective product.

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From this perspective, the continuous reduction of the costs involves four dimensions that must be integrated in the management of an organization, respectively [Epuran, Băbăiță, Grosu, 1999, p. 399]:

- taking into account the environment (the markets and the competition);
- integration of the skills of the various functions of the enterprise;
- viewing the products from the perspective of the effects of the current decisions on future outcomes;
- creation of some tighter connections between budgeting and the control of the current activity.

Some authors, following the model of the **Japanese kaizen** (the cost reduction of the existing products) advocate for the continuous verification of the standard costs (1). The studies performed by Monden (1989), Sakurai and Huang (1989) and Sakurai (1990) showed that there is a trend in the Japanese auto industry which ignores the standard cost. There are also opinions according to which standard costs are extensively used because they offer information that can be used in several areas, such as: budget elaboration, cost control and assessment of performances.

Kaizen Costing (KC or continuous cost management) replaces the Target-Costing (TC) method and is the expression of an upstream return, towards the causes of performance, which is possible in a transversal vision and by performing an analysis of the processes according to the conception of the activity-based costing method (ABC-Activity-Based Costing).

The kaizen costing activity involves that the planning team, after establishing and implementing the product and process design, must focus on the operational character of the process and on its development in the most efficient manner. This activity determines the managers or the operators of the system existing within the organization to focus their attention on cost reduction.

The KC and TC methods are similar in that they follow a target, but they differ in the following aspects: [Diaconu, 2003, p. 141]

1) *the way they set the respective target*, namely: the TC method starts from the requirements of the customers, whereas the KC method relies on the profitability of the objectives imposed by the managers;
2) *the use modality* – the TC method is used by the design team before the product is launched and ready to be manufactured, whereas the KC method is employed during the manufacturing of the respective product.

The application of the KC method involves the improvement of the production process via:

- optimization of the launch system in fabrication;
- setting the machines;
- increase of the performances of the machines;
- staff formation and motivation;
- encouragement of the staff charged with the identification of the cost reduction possibilities.

We may notice that KC does not focus on the product, but on the production process, and in this process the most important dimension is the organizational one, respectively the communication capacity. Professor H. Bouquin underlined that “Kaizen costing occurs during the manufacturing of the existing products”. [Bouquin, 2004, p. 196]

Daihatsu perceives the kaizen as one of the six valences of the budgeting process (in relation to a five years' budget), which comprises the following components: [Bouquin, 2004, p. 276]:

1) the budget which defines sales, variable costs and margins;
2) the budget for the supply with materials and raw materials;
3) the budget for rationalizing the plant and reducing variable costs (the essential part of kaizen);
4) the budget for the use of the work force;
5) the investments budget;
6) the budget for the capacity costs of the enterprise and for general expenses.

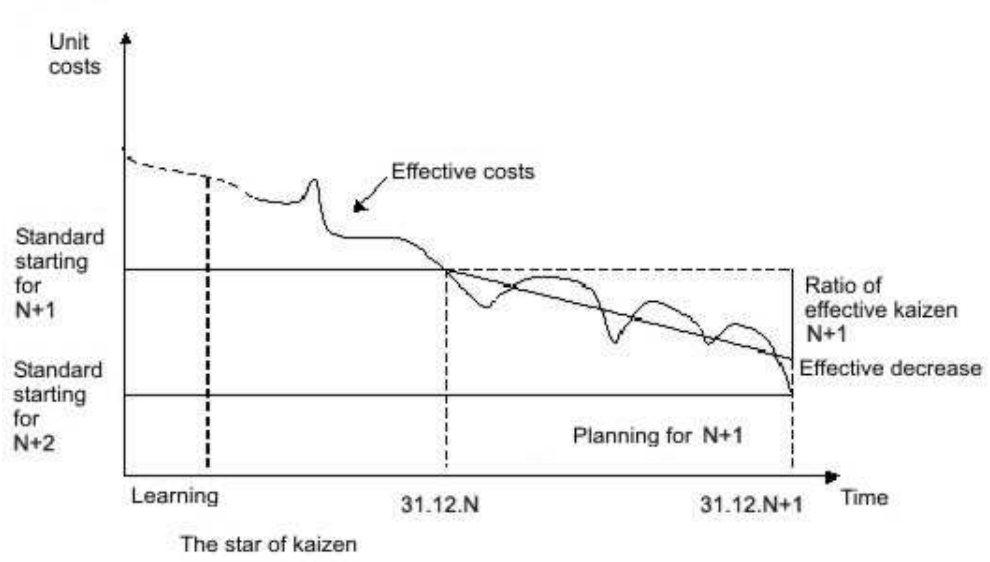

Figure no. 1. Kaizen conception

Just like Toyota, Daihatsu, its shareholder, applies direct costing in its plants in order to motivate operators to reduce costs. The standard cost for the next year is the cost achieved at the end of the previous year. It enables calculation via extrapolation, based on sales objectives and on the budgeted margin (budget 1). Budget (2) and (3) determine the expected reduction of the variable costs (the kaizen rate is given in figure no. 1). [Bouquin, 2004, p. 279] The other three budgets define the estimated fixed costs, which enables the calculation of the budgeted profit. When a new product is launched into fabrication, the Kaizen method can be used only after a period appreciated as necessary and sufficient for a learning process to develop and produce effects. Kaizen starts when the curve of the unit cost touches the asymptote. (2)

The concept which underlies the Kaizen Costing method is that of the target cost, calculated according to the principle of the standard cost. Thus, the monitoring and analysis of the deviations is made through the use of a conversion table in a reference production (for example, the number of target hours).

If we take the data concerning the target costs and the target hours corresponding to March 200N, determined by using the Target-Costing method, for the three engines manufactured by a company specialized in the production of such assets, as well as the related effective time, we obtain the comparative situation in table no.1. The average monthly production of 85 pieces for engine 1, 220 pieces for engine 2 and 150 pieces for engine 3 was estimated for the entire lifecycle of the three products, the probable duration being 4 years.

Table no. 1. Calculation elements

No.	Activities	Engine 1		Engine 2		Engine 3	
		Effective unit time	Target unit time	Effective unit time	Target unit time	Effective unit time	Target unit time
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1.	Assembly	8	7	4	3	6	5
2.	Quality control	2	2	1	1	2	2
3.	Processing	3	3	1	1	4	3
4.	Manipulation of materials	6	5	2	2	5	4
5.	Total work hours	**19**	**17**	**8**	**7**	**17**	**14**
6.	**Target cost**	**-**	**12.800**	**-**	**7.400**	**-**	**10.000**

Performance is calculated by taking as a reference model engine 2, taking into consideration its target time, of only 7 hours, by using the Kaizen Costing method, we obtain the data in **table no. 2.**

Table no. 2. Calculation of performance via the Kaizen Costing method

No.	Explanations	Manufactured quantity (pieces	Target unit time	Target total time	Estimated cost (lei/piece)	Effective unit time	Effective total time
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1.	Engine 1	85	17	1.445	16.166	19	1.615
2.	Engine 2	220	7	1.540	9.748	8	1.760
3.	Engine 3	150	14	2.100	12.532	17	2.550
4.	Total	-	-	5.085		-	5.925
5.	Target in equivalent engine 2	5.085/7=726 pieces	-	-		-	-
6.	Effective time in equivalent engine 2	-	-	-		-	5.925/726=8,16ore
7.	Performance		7/8,16=85,78%	-		-	

The effective time should have enabled the manufacturing of 726 engines belonging to model 2, production which would have required an effective unit time of 8.16 hours. In this case, the performance obtained is of only 85.78%. This phenomenon is much more visible from the perspective of the rather significant differences between the estimated costs and the target costs of 3.366 lei for engine 1 (16.166 lei-12.800 lei), 2.348 lei for engine 2 (9.748 lei-7.400 lei) and 2.532 lei for engine 3 (12.532 lei-10.000 lei).

Nevertheless, establishing the budget via the kaizen method entails continuous improvement, which involves finding practical solutions in order to reduce the difference between the estimated cost and the target cost without affecting product value, for example the reduction of the volume of production work hours throughout the management periods to come (see **table no. 3**).

Table no.3 Number of budgeted hours for the year 200N

No.	Explanations	Quarter I	Quarter II	Quarter III	Quarter IV
0	1	2	3	4	5
1.	Engine 1	17	15	13	8
2.	Engine 2	7	6	8	6
3.	Engine 3	14	12	13	9

In quarter II, if we take as a reference model engine 2 and we use the Kaizen costing method we obtain the data in **table no. 4.**

Table no. 4. Calculation of performance via the Kaizen Costing method

No.	Explanations	Manufactured quantity (pieces	Target unit time	Total unit time	Estimated cost (lei/piece	Effective unit time	Effective total time
0	1	2	3	4	5	6	7
1.	Engine 1	85	15	1.275	15.550	16	1.360
2.	Engine 2	220	6	1.320	8.934	6	1.320
3.	Engine 3	150	12	1.800	11.716	12	1.800
4.	Total	-	-	4.325		-	4.480
5.	Target in equivalent engine 2	4.395/6=732 pieces	-	-		-	-
6.	Effective time in equivalent engin 2	-	-	-		-	4.480/732=6,1ore
7.	Performance		6/6,1=98,36%	-		-	

The calculi above show that the performance achieved in this case is higher than that in the previous period, reaching 98.36%. Following this phenomenon, the difference between the estimated and the target costs, namely 2.750 lei for engine 1 (15.550 lei-12.800 lei), 1.534 lei for engine 2 (8.934 lei-7.400 lei) and 1.716 lei for engine 3 (11.716 lei-10.000 lei) were also reduced.

Most often, by taking into account the competencies of the company at the moment of the calculation, the evaluation of the product cost leads to the appearance of an estimated cost which is superior to the preceding target cost. In this context, *one of the objectives of the target costing method, by using budgeting via the kaizen method, will consist in reducing the difference between the estimated and the target cost, in finding solutions and, therefore, in applying the systematic changes for the optimization of the value-cost relation with regard to the product.*

If this company does not achieve the continuous improvement objectives, then the effective number of work hours will exceed the budgeted level in the last quarters of year 200N. If this reduction of hours refers to the hours of direct work (assembly, processing etc), it will lead to the reduction of the general variable management expenses because the number of hours of direct work is the determinant of these expenses.

The advantage of the KC method is given by the technical knowledge used by several departments and by the use of some transversal, "global" management tools (ABC, benchmarking). The traditional calculation systems, which include budget reserves and the division of the enterprise in autonomous spaces, represent an impediment for the TC and KC methods. In order to overcome this situation companies must make use of tools that require dialogue (transversal), a transversal organization (projects, simultaneous engineering, and multidisciplinary teams), a company culture oriented towards the customer, a career management and motivation system that favors collective solutions. (3)

The criticism of the TC and KC methods refers, first of all, to the stress the staff is subjected to due to their application. In response to this critique, some organizations preferred to reduce the degree of performance generated by these methods in order to reduce stress. It is worth noting the fact that these continuous cost reduction methods are stressful through their very nature. Therefore, we must avoid the tensions created by ¨the dictatorship of marketing¨ and some difficulties such as: the excessive segmentation of the market, the increased communication costs and the pressures on the suppliers.

In order to achieve the continuous cost reduction objectives, kaizen budgeting must target the entire organization, and this involves adequate management which must focus on the following aspects:

- control of all the phases of the lifecycle of a product or service;
- making sure, in a progressive manner, that the new products will be profitable throughout the entire duration of their life cycle (monitoring of the costs during this cycle by comparing the estimates and the obtained results, with reference to the selling price of the competition)
- establishing all the elements of the supply chain, inclusive for the suppliers of parts and collaborators, the objective of the continuous search of opportunities for reducing costs. For example, at the Citizen plant in Tokyo, the budgets include constant reductions of the costs of the purchased raw materials, of 3% per year.
- the engineers of the company collaborate with the suppliers in order to help the latter reduce their own costs by 3%. The suppliers who manage to obtain cost reductions of more than 3% register bigger profit; [Horngren, Datar, Foster, 2006, p. 212]
- mobilization and motivation of all the competencies within an organization via a transversal approach, thus favoring competitiveness.

To sum up: a significant part of the cost reduction associated with budgeting via the kaizen method results from "minor" improvements and not from "major leaps". An impor-

tant aspect of budgeting via the kaizen method is given by the quantity and especially the quality of the suggestions made by the employees of the organization.

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Note

1. **Kaizen** means the inexorable monitoring of the progressive improvement of product quality without a time limit and by fully using the company resources.
2. **Asymptote** is the straight line that is approached by a curve, but that it only touches at infinity.
3. **Simultaneous engineering** represents the realization in parallel of all the stages that are traditionally executed in sequence.