

Planning, Accounting, Analysis, Evaluation, Management and Administration of Costs on Promoting Finished Product Quality Provision

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Abstract:

It should be noted that the above mentioned approach to the system of distribution of bonuses for the labor quality allows for relaying the incentive system, focused on the final results, from an industrial enterprise and a research-production association in general to each individual employee. It is recommended for employees with decentralized formation of material incentive fund for the main production workshops to increase the size of the material incentive fund for each workshop, providing an increase in the number of employees with a personal stamp and in the number of employees, supplying finished products from the first presentation during certain long period of time (several months). The offered mechanism of the control system is quite universal. It can find its full application in industrial enterprises and research- production associations, regardless of their sectoral and structural profile, and it makes possible to solve the control issue by the criterion for estimating the optimal mismatch. The selection of labor quality parameters as criteria for evaluating bonus payments simultaneously ensures a reduction or streamlining of costs associated with the quality of finished products provision.

Keywords: quality, provision, division, bonus payment, distribution, promoting.

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1. Introduction

Given all the variety of impact factors affecting the economic efficiency of modern industrial production, improving and providing the quality of finished products is the most important task faced by employees of the national economic system at the present time. Solving the issue of increasing economic efficiency and quality, an important role is played by the improvement of the production and economic mechanism of the quality management system of the finished products.

The need to improve the efficiency of modern, functionally developed production process and quality of labor sets the task for economics to develop such a theory and management system technology that would

focus on solving the problem of quality improvement with the best combination of interests of the national economic system and interests of industries and enterprises (associations) with the complex influence of organizational, technical, economic factors on industrial manufacturing plant and beyond. Therefore, the issues of improving the quality of finished products should be resolved on the basis of integrated management systems while strengthening the information-guiding apparatus and the role of economic indicators in their composition.

In the conditions of industrial enterprises activities at the present stage of market relations and management of production and economic activity, when each component of the property is

billed, when the wholesale price of the finished product, and hence the income (revenue) from the sale of the enterprise (association), is directly dependent on the quality of the finished product, a more in-depth development of the above mentioned list of issues becomes particularly relevant.

2. Distribution of material incentive fund

Considering bonuses as a form of feedback, as an incentive to work diligently and prevent damage from an unfair attitude, this task, along with general requirements, aims to stimulate the final results on the quality provision criterion for the finished product at optimal costs. The premium will only be adequate to real achievements in labor under genuine conditions, if it is based on accurate and full consideration of the characteristics and working conditions of the units and employees, and its mechanism of action is subordinated to the main goal of the production process - to achieve the final results, in the context of the given task - to provide quality of the finished products with minimal cost.

While accepting the order of incentives for quality of labor adopted at enterprises and acting within the framework of recommendations, it seems appropriate to offer such an incentive tool that would fit the nature of the quality provision process better than within the framework of the existing incentive

system, while preserving its sources, payment limits, but changing the criteria and mechanism of action of the incentive system. The given article considers the combination of these elements of the method in the offered incentive scheme.

The criterion for bonus payments to employees of the quality management service is the achievement of an optimal mismatch of the performance indicator.

3 Forming the size of bonus payments to units

The most important and underexplored issue in the theory of material incentives is the issue of the size of the material incentives fund, allocated to the unit. In this case, an economically feasible approach is to construct a scale of bonuses, on the basis of which the size of the bonus fund, received by the unit, will be carried out by means of an economic and mathematical substantiation of the incentive function. This approach is well-known in the literature (Grinyova, Vlasenko, 2005), (Vnukovskaya, 2015), (Zhuk, 2015). However, its application is recommended for the distribution of bonus payments between employees. In the given case, this method is appropriate to apply for the formation of the encouragement fund.

Among all possible types of incentive functions, the exponential function (Fig. 1) is the most reasonable.

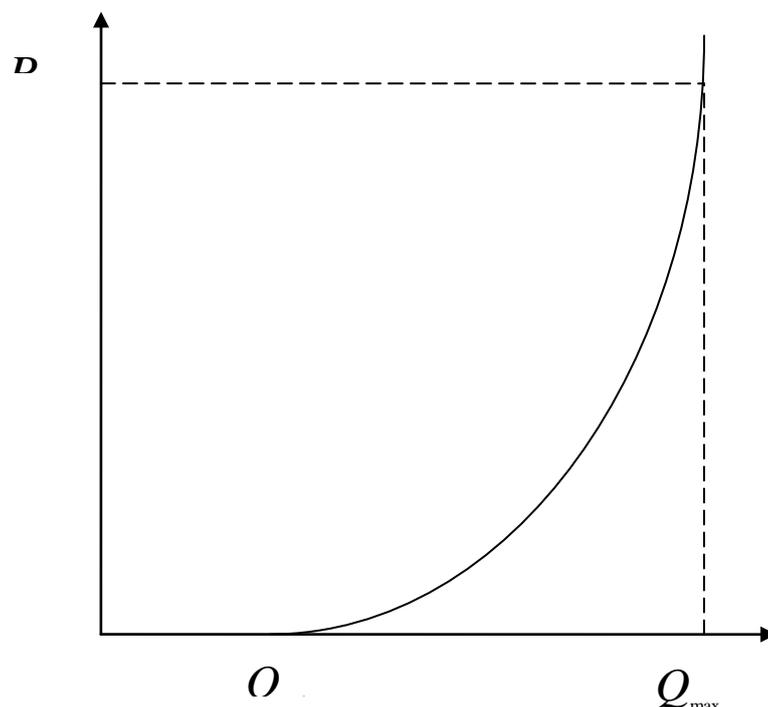


Fig. 1. Bonuses fund function:

P - amount of bonus; Q - indicator of labor quality

Curves of this type can be approximated by functions of the type, formula (1):

$$P = e^{aQ} - b, \quad (1)$$

where: a and b - constant coefficients of the bonus fund function;

e - the basis of natural logarithms.

The exponential function stimulates the unit to achieve an optimal quality performance indicator, since as the unit performance quality indicator Q_{cal} approaches Q_{max} , equal to 100, the size of bonus payments progressively increases.

This approach needs clarification. It would be logical in our case to direct the calculated indicator of the quality of the unit's labor to the optimal one, but one cannot abstract from the mathematical specifics of the generalized indicator of the quality of labor of an industrial enterprise. It is formed according to a logical chain of consecutive works on quality provision, as the product of power functions of the indicators of the quality of a unit's labor, formula (2):

$$Q = Q_1^{l_1} \cdot Q_2^{l_2} \cdot Q_3^{l_3} \dots \quad (2)$$

Such construction is very sensitive to the Q slightest decrease - with an insignificant $Q_i^{l_i}$ decrease in individual labors, there is a

sharp Q drop for the enterprise as a whole. Therefore, the individual indicators of the units' labor should be adjusted, if possible, to 0.99-0.98, and then the cumulative indicator of the quality of labor will be achievable.

a and b constant coefficients are determined from the P_{min} boundary conditions at Q_{cal} and P_{max} , at $Q_{max} = 100$, where Q_{cal} for each unit and, accordingly, for each type of labor is defined as a complex indicator of the quality of the unit, taking into account the corresponding weighting factor according to the tables.

Taking $Q_{max} = 100\% P_{max}$ for the unit at up to 100% of the total wage fund is to increase interest in high quality indicators. The step scale with a change in bonuses at intervals, according to the exponential law of changing the bonuses fund function, (Fig. 1) is given in Table 1.

Table 1
The scale of the formation of the material incentives fund for unit on the basis of exponential function

Unit performance indicator	The size of the bonus to the unit's payroll fund
1,00-0,99	0,967
0,99-0,98	0,934
0,98-0,97	0,901
0,97-0,96	0,869
0,96-0,95	0,837
0,95-0,94	0,806
0,94-0,93	0,78
0,93-0,92	0,74
0,92-0,91	0,713
0,91-0,90	0,698
0,90-0,89	0,66
0,89-0,88	0,64

0,88-0,87	0,59
0,87-0,86	0,56
0,86-0,85	0,53
0,85-0,84	0,52
0,84-0,83	0,48
0,83-0,82	0,45
0,82-0,81	0,42
0,81-0,80	0,4

Within the framework of the above mentioned table, it is necessary to organize the accounting of the functions fulfillment by each employee according to the form given in Table 3.

Table 3
The record of the performance of professional tasks by employees

Index	Task content	Completion schedule	Task completion mark	Timeliness mark

<i>n</i>	Total number of tasks		×	
<i>n+1</i>	Total number of outstanding tasks		×	
<i>n+2</i>	Number of tasks not completed on time			×

The presence of such documents allows for organizing information for the formation of a defect-free indicator and an indicator of the timeliness of performing tasks (functions) or rhythm.

The indicator of the defect-free performance of the performer (*B*) is formed as follows, formula (3):

$$B = \frac{n_4 - (n-1)4}{n_4} \quad (3)$$

where: n_4 - data n lines and 4 graph;
 $(n+1)4$ - data $n+1$ lines and 4 graph.

The indicator of timeliness or rhythm (*K*) is determined by the formula (4):

$$K = \frac{n_4 - (n-2)5}{n_4} \quad (4)$$

where $(n+2)5$ are the data $n+2$ lines and 5 graph.

In order to determine the productivity indicator, it is necessary to organize in each of the services the accounting of defects in finished products by performers according to the form given in Table 4.

Table 4
The record of defects in finished products by performers

№	Defect types	Number of defects in the finished product	Responsible for defects	Term detection of defects

The fact of the presence of a defect in the finished product due to someone's fault is

estimated at 10 points for reducing the premium, and each defect is equivalent to one point for reducing the premium.

In addition, the cost value of defects (Table 5) can be applied, which characterizes the cost side of the damage caused by defects.

Table 5
Cost value coefficients for defects in finished products

Defect name	Value coefficients
Defects due to the fault of designers	0,057
Defects due to the fault of technologists	0,012
Defects of components	0,145
Defects caused by the actions of employees	0,207
Defects caused by the actions of master	0,074
Defects related to the violation of technological discipline	0,049
Defects detected during manufacturing	0,216
Defects detected during testing	0,041
Defects detected during warranty service	0,095

It is possible, due to the correlation of the cost on providing quality characteristics and technical parameters, to calculate which increase

in costs corresponds to the appearance of defects of one kind or another from the data Table 6.

Table 6
Information model of forming the optimal value of the cost on the quality provision of the finished product

Source address	Source Data	Output Data (optimal cost on the finished product quality)	Information Consumers
Planning and Economic Department	Cost of quality provision at enterprises	$20,21\delta^{-0,460}$	Product Quality Department
	Economic effect due to quality provision at enterprises-consumers of finished products	$13,480a^{-0,0436\delta}$	Planning and Economic Department
Sub-industry department of the finished products quality	Indicators of the labor quality at enterprises. Total economic effect	$\hat{Y} = 20,21\delta^{-0,460} + 13,480a^{-0,0436\delta}$	
	Optimal value of the mismatch	$\delta = 8,6 \%$	
Calculation Results	Optimal value of the cost on quality	$\zeta = 7,51 \%$	

It is possible, therefore, to calculate the absolute amount of losses caused by defects in production, and deduct this amount from the value of the premium of the performer.

The integral indicator of the labor quality of each performer (K_i) can be calculated by the formula (5):

$$K_i = B \cdot P \cdot K_r, \quad (5)$$

where B , P , K_r - respectively, the coefficients of defect-free, productivity and rhythm.

Flawless performance of functions, work without defects, as well as the absence of violations of the labor terms means a high-quality work. In this case, the quality factor of labor will be equal to one. Each failure to perform a function or presence of defects in the finished product, as well as untimely performance, will cause a significant decrease in the integral index. Then fairly the share of payments to a certain performer (P_p) will be determined by the formula (6):

$$P_p = \frac{P_s}{N_p} \cdot K_{q,p}, \quad (6)$$

where: P_s - the value of the bonus fund received by the service;

N_p - the number of performers in the service;

$K_{q,p}$ - the quality coefficient of the performer.

Such approach to the system of distribution of bonus payments for the labor quality allows for relaying the incentive system, focused on the final results, from the enterprise in general to each employee.

For employees with a decentralized formation of a material incentive fund for the main production workshops, it is recommended to increase the size of the material incentive fund for each workshop, providing an increase in the number of employees with a personal stamp and in the number of employees, supplying finished products from the first presentation during certain long period of time (several months).

The offered mechanism of the control system is quite universal. It can find its full application in industrial enterprises and research-production associations, regardless of their sectoral and structural profile, and it makes possible to solve the control issue by the criterion for estimating the optimal mismatch. The selection of labor quality parameters as criteria for evaluating bonus payments simultaneously ensures a reduction or

streamlining of costs associated with the quality of finished products provision.

4. Conclusion

The research question of managing quality expenditures is highlighted by the need to include all reserves and opportunities, to improve economic efficiency and qualities, including the ability to calculate, analyze, evaluate and measure costs and results in a correct way.

The general idea of the given article, justifying the need for an interconnected system of the quality management cost indicators, follows the tasks on resource saving, a sharp increase in the economic efficiency of the production process and an increase in the quality of products, set by the President and the government.

The scientific task, set by the authors, is to explore the role of costs as a balancer of the economic efficiency in the functioning mode of the finished product quality management system, the determination algorithm, the calculation methods, identification, accounting, forecasting and coordination of the costs on the quality provision of finished product. Along with theoretical studies, the article presents practical calculations, confirming the correctness of the scientific and methodological conclusions made by the authors. Taking into account, however, the sufficient novelty of the approaches to the problem of managing the costs of providing the quality of finished products described in the given article, the authors will be grateful to those readers, interested in solving the above mentioned issues, for their comments to the given research.

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