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INCREASING LABOUR PRODUCTIVITY AT INDUSTRIAL
ENTERPRISES

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Abstract

The relevance of the study is due to the importance of creating conditions for the growth of productivity at enterprises in the modern economy. The key problem is the contradiction between the goal-setting system used in enterprises and the interests of specific performers, which leads to conscious and subconscious blocking of achieving the goals of the enterprise. The purpose of the article is to create a toolbox for increasing the productivity of an industrial enterprise on the basis of resolving contradictions between managers at various levels and performers directly doing their job. The following theories were considered as a leading approach: the theory of solving inventive problems, diversionary analysis, management theory, personnel management theory, including the concept of key performance indicators. The factors that reduce the effectiveness of the system for determining key performance criteria for the growth of labor productivity have been reviewed in the research. The contradictions between the goals of various levels of enterprise management and individual subjects and objects of management have been identified; the requirements for a system of key performance indicators have been substantiated. The latent defects inherent in the design of the goal-setting system, which sharply reduce the level of confidence of performers in the system of target performance indicators, have been described. The measures to overcome the contradictions between the goals of different levels of management have been justified.

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Keywords: Goal setting, TRIZ, contradictions, productivity, staff, efficiency.



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1. Introduction

The relevance of the study is associated with the need to increase labor productivity in enterprises in modern conditions, since currently there is a sharp drop in productivity in Russian enterprises. Possible reasons for this phenomenon are associated with low revenue, low prices for manufactured products, insufficient production volume, excessive number of employees, and irrational use of working time.

The current conditions of the Russian Federation are also characterized by a sharp aggravation of the contradiction between the heads of enterprises and employees of enterprises, which leads to an acute struggle between them, and this format of relations has the character of hidden enemy actions aimed at upholding their own positions by both sides.

The reason for this state of affairs, in our opinion, is the initial logical premises underlying the thinking of many managers and employees at Russian enterprises, which have developed under the influence of long-term experience of serfhood. In addition, different interpretations of the concept of productivity used in the economic literature also make impact.

In the classical form, labor productivity is interpreted as an increase in the product per unit of time per worker. More modern definitions focus on competitiveness and product quality. This approach is being developed in the concept of lean manufacturing.

Another position in the interpretation of labor productivity is that the growth of labor productivity means not only an increase in manufacturing of a product per unit of time, but above all a decrease in the unit cost of this product, which ultimately helps to increase the competitiveness of the product and promote it in the consumer market.

2. Problem Statement

The following problems can be defined:

- to show the existing manifestations of internal contradictions between the heads of enterprises and employees;
- to consider existing methods for setting targets by enterprise managers to stimulate productivity, as well as latent defects embedded in them that reduce the confidence of performers on enterprise managers;
- to systematize the methods of employees of enterprises aimed at restraining the actions of managers to increase labor productivity;
- to propose measures aimed at resolving the contradictions between the goal-setting system of enterprise managers and the counter-actions of enterprise employees.

3. Research Questions

The object of research is a process of growth of labor productivity in industrial enterprises.

The subject of the research is a system for setting targets in the field of labor productivity of enterprise employees, as well as methods for overcoming the contradictions between the goals of individual managed subsystems and levels of enterprise management.

4. Purpose of the Study

The purpose of the article is to create a toolbox for increasing the productivity of an industrial enterprise on the basis of resolving contradictions between managers at various levels and performers directly doing their job.

5. Research Methods

The methodological basis of the study is the technology and methodology of economic analysis, in particular the methods of factor analysis, as well as the method of system analysis, allowing considering this problem from the perspective of a large number of subjects, as well as taking into account a wide range of influencing factors. The leading approaches to research were theories such as: the theory of solving inventive problems, diversionary analysis, management theory, personnel management theory, including the concept of key performance indicators.

Problems of labor productivity growth in domestic economic science are represented by the following works (Axelrod & Chumakov, 2016; Khusainov, 2015; Kireev, 2016; Makarova & Shokhnekh, 2019; Mustafin, 2016). In the works of (Dymkovets et al., 2017; Glushchenko & Glushchenko, 2019; Graves & Sarkis, 2018; Kirushin et al., 2017), the issues of leadership formation in innovative strategies, as well as the formation of a system of key indicators of activities of employees of enterprises are revealed. Motivation issues are covered in the following works (Borisov et al., 2018; Bugaeva et al., 2019; Scherbakov et al., 2018; Sycheva et al., 2019).

Interesting studies in the field of remuneration are presented by works (Gorzhiy & Rosenbaum, 2016; Popov, 2016; Voronin et al., 2018).

Problems of personal management are posed in the following works (Grebneva & Ovchinnikova, 2019; Gurova et al., 2018; Makaryeva et al., 2019).

Human resources management issues are highlighted in the writings of Ahmed et al. (2018); Brazhnikova (2019); Danko et al. (2018); Horev and Stefan (2017); Senatorov (2018).

The article (Rashid et al., 2016) describes an approach to integrating the theory of solving inventive problems and designing solutions in accordance with customer needs.

Based on the analysis of these works, we came to the conclusion that it is necessary to increase labor productivity through the development of preventive measures. These measures will prevent the emergence of problems in the way of increasing the flexibility of labor productivity. Methodological range of tools for the development of preventive measures is a technology of sabotage analysis. In the framework of this technology, it is necessary to pose the question as follows: "How to make sure that labor productivity cannot grow in accordance with the required target values?"

For illustrative purposes a diversionary analysis of such a direction as a goal-setting system in the workshop will be carried out.

- Superiors put a system of performance targets with corresponding bonuses. Thus, they regulate the movement of people in the required direction.
- Performers are looking for loopholes in the scorecard to increase their income.

If the system is not initially balanced, serious imbalances occur in the control system. People's efforts are spent in the direction that provides maximum income for concerned parties. Organizational resources are starting to get dissipated. Employee time starts to be spent in vain.

A very serious contradiction arises between the intended goals of the management system and how these goals are understood by the performers.

The measures which managers initiate to achieve their goals are considered:

- Managers change indicators before the reporting period if they see that the actions of people are going in the wrong direction.
- They put restrictions on the limit values of individual performance indicators, which make it impossible to generate income through concentration in one direction. For example, they put a limit on the maximum number of rational offers for which you can get an additional bonus.
- Initially, there are inaccuracies in the wording, which allows having freedom of action when interpreting the rules in one direction or another.
- Initially, the minimum values of individual indicators, which are a prerequisite for generating income, are determined.
- Conditions for internal competition between performers are created. In this case, the overall effect can be distributed among the performers depending on the number of points they have earned. For example, a predetermined amount of money is allocated to a group of performers. Each performer scores points for individual activities, and at the end of the reporting period, the scores of all performers are summarized. Next, the price of one point is determined as the ratio of the allocated amount of money to the sum of all points. The award of each performer is defined as the product of their points by the price of one point. As a result, a situation arises in which the more points each individual performer scores, the lower the price of one point and more efforts have to be made to get a bonus.
- A zone of fear for performers is created. For example, the need for 80 percent of performers who receive the right to income is prescribed. The remaining 20 percent of conditional losers fall under certain penalties.
- They cancel part of the indicators of test and control equipment (TSE) or, in principle, cancel the system as a whole if it ceases to correspond to the idea of the leaders on the role of TSE in improving the overall performance of the enterprise.

In turn, the performers also develop and effectively use a number of measures that allow them to resist the actions of manufacturers.

- Managers are looking for those indicators, the implementation of which is associated with the least effort. This is necessary to ensure personal safety, so as not to fall into the number of those employees to whom penalties may be applied for failure to meet the target values.
- They are looking for those indicators, the implementation of which provides the highest income, even if this leads to an imbalance in the goals of the entire enterprise and excessive consumption of resources.

- They are looking for inaccuracies in the wording, trying to find additional loopholes in the target system.
- They are looking for those levers and actions that have a multi-purpose character. That is, they can be used in conditions of changing the system of targets.
- Initially, managers occupy a passive position, clearly understanding that the principle “Today is a record, tomorrow is the norm” can work. In this case, the performers try to fulfill the minimum necessary threshold of target indicators. This is necessary to ensure safe working conditions and to neutralize the potential threat of dismissal.

In the context of such a permanent struggle, a number of negative consequences arise due to uncoordinated actions of managers and executors. Among them are the following:

- Overuse of material resources of the organization in a situation of clearly excessive fulfillment of individual performance indicators. Here, a common example is the common situation at enterprises, when an employee tries to perform those types of work where high prices are observed, and not those that are necessary for the timely delivery of the order on time to the customer. Or employees can produce an excess amount of products for which you can get more cash, regardless of the real needs of the market. As a result, overstock of the finished goods warehouse and freezing of the enterprise’s funds in stocks may occur.
- Cost overrun of the enterprise subject to changes in the payroll of employees. This is due to the fact that the cost of staff wages for the work they perform can significantly increase.
- Failure to meet targets in conditions of a dramatic drop in the confidence of performers in the words and actions of managers. It happens when the executives understand that the management can at any time change the system of targets or lower the prices for performing individual work items.
- A loss of motivation for meeting indicators when employees realize that they are in a situation of “bankrupt growth”. This happens when the growth of the achievements of individual performers under the conditions of a preliminarily limited amount of the total premium leads to lower prices and lower income levels of an individual performer.
- Developing a situation called "Running on the spot." In this case, employees are engaged in simulating violent activities, performing the most formal indicators, the benefits of which are not for real activities.

In a systematic way, the identified actions of leaders and counter-actions of performers are presented in table 1.

Table 01. Actions of leaders and counter-actions of performers

№	Actions of managers	Counter-actions of performers	Possible result
1	Change TSE before the reporting period, if they see that the actions of people are going in the wrong direction.	They are looking for those levers and actions that have a multi-purpose character. That is, they can be used in	Overuse of material resources in a situation of clearly excessive fulfillment of individual TSE.
2	Abolish part of TSE or, in principle, cancel the system as a whole if it ceases to		

	correspond to the idea of managers about the role of TSE in the work of the enterprise as a whole.	conditions of changing TSE system.	
3	Initially, there are inaccuracies in the wording, which allows for freedom of action when interpreting the rules.		Failure to fulfill TSE in conditions of a dramatic drop in the confidence of performers in the actions of managers.
4	Set limits on the extreme values of individual TSE, which makes it impossible to generate income through concentration in one direction.	They are looking for those TSE, the implementation of which provides the greatest income, even if this leads to an imbalance in the goals of the entire enterprise and excessive consumption of resources.	Overexpenditure of financial resources of the enterprise when changing the wage fund of employees.
5	Create a zone of fear for performers. For example, the need for 80 percent of performers who receive the right to income is prescribed. The remaining 20 percent are subject to certain penalties.	They seek inaccuracies in the formulations, trying to find additional loopholes in the system of targets.	Employees perform the most formal TSE, the benefits of which for real activities are not.
6	Initially, the minimum values of individual indicators, which are a prerequisite for generating income, are determined.	They are looking for those TSE, the implementation of which is associated with the least effort.	
7	They create conditions for internal competition between performers. In this case, the overall effect can be distributed among the performers depending on the number of points they have earned.	Initially, they take a passive position, clearly understanding that the principle "Today is a record, tomorrow is the norm" can work.	The decline in motivation for the implementation of TSE.

In our opinion, the key contradiction in the goal-setting system is that the logic of thinking of managers implies the idea that the growth rate of productivity should outstrip the growth rate of wages. To do this, the given ways should be followed:

- increase the staff development plan;
- inhibit the growth of salaries of performers;
- reduce the rate of time for performing certain operations;
- reduce prices for the performance of certain types of work.

A key drawback of this logic is its complete transparency for experienced performers. The principle "Today is a record, tomorrow is the norm!" lies in the genetic memory of employees of enterprises in Russia. Accordingly, experience has developed a serious measure of resistance: you cannot overfulfill the

plan by more than a few percent! Over fulfillment of the plan entails either an increase in the plan for the next period, or a decrease in wages.

Let us state the contradiction:

- the plan needs to be improved, as this improves productivity;
- the plan does not need to be increased, as this causes resistance of employees due to fears of a decrease in wages.

The standard solution that allows you to remove this contradiction is to work in weekends or work overtime.

Work in weekends is attractive for performers with double pay, and from the position of the company it is attractive in that it allows performing the required amount of work. In reality, the work proceeds as follows: during the working time, employees make the required amount of production, but at the same time hide part of the production, creating an artificial shortage and provoking the failure to fulfill the production plan.

In overtime, performers imitate violent activity, get pre-prepared products and ensure the implementation of the plan. At the same time, remuneration of labor occurs at a double rate, which allows increasing the income of employees.

This practice is widespread in Russian enterprises and has a deep economic meaning, as it provides benefits for both the enterprise and the employees of the enterprise. Employees of the enterprise have the opportunity to increase their income, and the company has the ability to regulate the cost of labor of workers depending on the real need to produce a particular volume of products. This situation on a conditional example is considered in table 2.

Table 02. The cost of wages of workers who work overtime

Indicator	Value
Number of employees	100
Salaries of employees during work according to the standard schedule, rubles/person	100
Labor costs, rubles	10000
Number of employees employed overtime, people	20
Salary of employees when working overtime, rubles/person	200
Labor costs, rubles	4000
Total labor costs of workers, rubles	14000

Table 03. Costs of wages of employees with an increase in prices

Indicator	Value
Number of employees.	100
Salary of employees when paying at a double rate, rubles/person	200
Labor costs, rubles	20000
Salary of employees when paying at the rate of time and a half, rubles/person	150
Labor costs, rubles	15000

As can be seen from tables 2 and 3, it is economically more profitable for an enterprise to use a system of low wages during working hours with simultaneous exit of employees outside working hours with payment at a double rate. Thereby, the following effects are achieved:

- Labor costs do not occupy a significant share in the total costs of the enterprise.
- Labor costs directly depend on the actual use of labor.
- Labor costs are not fixed and can be continuously adjusted depending on the requirements of the growth of production volume.
- Only those employees who are really necessary for the production of the enterprise receive the right to higher wages.

At the same time, this scheme leads to the fact that workers objectively lose incentives to work effectively during the working day; in addition, there is competition for the right to work overtime, as well as artificially created conditions for slowing down processes during working hours to obtain the right to work in weekends and work overtime.

In these conditions, it is required to develop such measures that simultaneously satisfy several condition:

- productivity growth;
- wage growth;
- increased motivation of employees to implement the plan.

Among the measures that allow several conditions to be fulfilled simultaneously, the following can be distinguished:

- The introduction of a systematic reduction in the norms of time for operations with a simultaneous increase in prices for operations.
- Improving the quality of planning of production processes to increase certainty in the activities of employees.
- Increased manufacturability of auxiliary operations to reduce the overall time for operations.
- Deep elaboration of design solutions when designing products for manufacturability and defectiveness.

In the first direction, we propose to change the logic so that the goals of the enterprise and the goals of employees do not contradict each other, but, on the contrary, mutually support each other. To this end, we propose the following approach: reduction of standard hours for individual operations with a simultaneous increase in prices for operations.

The accelerated execution of operations requires higher qualifications and more rational organization of labor. Accordingly, a higher qualification of an employee implies increased pay. This approach was successfully applied at one time by such an entrepreneur as Henry Ford.

He introduced two revolutionary transformations into the enterprise's work system - he reduced the working day from 12 hours to 8 hours with a simultaneous increase in daily wages from \$ 2.5 to \$ 5. This led to the fact that work at Ford's enterprises became very attractive for employees and there was

competition between them for the right to work at the plant. The company was able to select the most qualified employees and thereby double the volume of its products.

6. Findings

That is, here we can unequivocally say that the goals of workers and the enterprise as a whole turned out to be coordinated and mutually supportive.

It should also be noted the importance of such a question as a way to measure performance. Depending on this, the points of application of the efforts of employees of the enterprise are changing. There are the following methods for measuring performance:

- the ratio of revenue in monetary terms to the number of workers in the enterprise.
- the ratio of the volume of output in physical terms to the number of people in the enterprise.
- the ratio of the volume of output in monetary terms to the number of standard hours worked.
- the ratio of the volume of output in physical terms to the number of standard hours worked.

In our opinion, the latter method of measuring productivity allows neutralizing the influence of factors such as prices of manufactured products and the number of people involved in the work and at the same time contributing to the introduction of advanced methods of organizing labor, machinery and technologies. This method of measuring productivity removes the contradictions at the level of the production subsystem of the enterprise between management and performers and significantly increases the mobility and flexibility of the system due to the sharp acceleration of all processes.

In the second direction, we consider it important to improve the quality of production planning. Often, enterprises have well-developed operational planning in the workshops when workers are given a shift-daily task that they must complete. Moreover, often the heads of the workshops do not have a sufficient idea of what they will be doing over the next week, and even more so a month. As a result, there is a constant unpredictable change of tasks and many tasks are solved in the mode of emergency and assault. This dramatically reduces the motivation of employees and their productivity. Improving the quality of the planning of production processes dramatically reduces the uncertainty of employee work, there is an understanding of what and by what time it is necessary to produce, reduced time for the buildup of units, reduced downtime of equipment and in general the process becomes more uniform and accordingly productive

The third area involves an increase in the technological effectiveness of auxiliary operations to reduce the overall time for operations. Auxiliary operations, as well as preparatory and final time, account for a large proportion of the total production cycle time. Accordingly, reducing the time spent on these operations, the company greatly reduces the time of the production cycle and increases output. This directly affects the growth of employee productivity.

Finally, the fourth area is associated with increased work efficiency in the design of new products and modernization of existing products. Labor productivity depends on how easy to manufacture the product. In turn, huge reserves to reduce the complexity of manufacturing products lie in the development of product design. That is, a detailed and constant testing of the design for manufacturability allows us to lay low labor intensity of production at an early stage and ensure a multiple increase in labor productivity.

In this area, it is possible to note such measures as the application of unification of parts, connection joints and assemblies in general, a sharp reduction in the number of parts in the product design without increasing the complexity of their manufacture, the use of equal strength structures to reduce the consumption of material resources, the search for new design methods to reduce the overall period the creation of new types of products, the application of the block-modular principle in design.

The application of these approaches requires some caution in the context of the traditions and business culture of Russian enterprises, in particular, a high level of distrust of performers in the actions and initiatives of management.

It should be noted that the resolution of contradictions at the level of the production subsystem exacerbates the contradictions between the sales and production subsystems, since they have different target settings. To solve this problem, it will be necessary to set restrictions on the part of the marketing subsystem for the production of certain types of products so as not to deal with the excessive production of certain types of products.

7. Conclusion

Based on the results of the study, the following conclusions can be drawn:

1) Currently, there is an acute contradiction between the goal-setting system used in enterprises to stimulate productivity and the actions of employees. This contradiction leads to dynamic actions, both by the management and the executors, while each side uses sophisticated measures to advance their position. The actions of managers are often focused on obtaining the desired result at the minimum cost of stimulating the work of employees, and the protective actions of employees are determined by the desire to increase their income level. The analysis and systematization of the methods of struggle showed that a huge experience has been accumulated in this issue by both parties, so it is difficult to expect any serious progress in this issue without changing the initial logical assumptions. Accordingly, it is extremely important to change the initial paradigm of thinking from the perspective of achieving the goals of one side by infringing on the interests of the other side and use a decision-making system based on mutually beneficial solutions.

2) To assess labor productivity, a large number of indicators are used, which differ in their specificity and factors that participate in the calculation of the resulting indicators. The choice of indicators determines the vector of the application of the forces of employees and stimulates the development of various methods of enterprise development. Among the common indicators are the following: the ratio of revenue in monetary terms to the number of workers in the enterprise; the ratio of the volume of output in physical terms to the number of people in the enterprise; the ratio of the volume of output in monetary terms to the number of standard hours worked; the ratio of the volume of output in physical terms to the number of standard hours used. We consider the latter to be the key performance indicator, since it most accurately reflects the physical essence of the concept of productivity, which does not depend on the influence of economic factors and allows correctly evaluating and comparing performance indicators in different periods and / or for similar enterprises.

3) The logic of thinking of many heads of Russian enterprises implies the need for exceeding the rate of growth of productivity over the rate of growth of wages. One of the consequences of this logic is the temptation to formally increase labor productivity due to the simple inhibition of employee wage growth.

This often leads to covert resistance from employees and their use of Italian strike tactics, sabotage and a sharp drop in motivation. The standard solution for resolving this contradiction is employees going to work in weekends or work overtime to compensate for low wages and at the same time stimulate actions to achieve the required targets.

We believe that the following approach is more effective: reducing the standard hours for operations, while at the same time a serious increase in prices for operations. The tightening of time standards stimulates the search for new technologies, the effective organization of labor, as well as the development of employee qualifications. Accordingly, more qualified employees are entitled to expect an increased level of income.

4) A comprehensive solution to the problem of productivity growth requires the development of solutions that can simultaneously ensure productivity growth, wage growth, growth of employee motivation to implement the plan. To this end, the following areas that work effectively within the production system have been identified: the introduction of a systematic reduction in the time standards for operations with a simultaneous increase in prices for operations; improving the quality of planning of production processes to reduce uncertainty in the work of employees; the technological advancement of auxiliary operations to reduce the overall time for operations; deep study of constructive solutions in the design of products for manufacturability and defectiveness.

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