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Telnov Anatoliy
Doctor in Economics, Professor
Reshmidilova Svitlana
PhD in Economics, Associate Professor
Khmelnytsky National University (Khmelnytsky, Ukraine)

PERSONNEL MARKETING AS A METHOD TO INCREASE LABOR PRODUCTIVITY

Introduction. In modern conditions, the leading role in the economic development of innovation processes is evident, which causes Ukraine's transition to an innovative model of development, the introduction of fundamentally new advanced technologies, the production of high-tech, science-intensive products. New competition, namely manufacturers focus on non-price policies that technical innovation and product quality become critical, companies require staff professionalism, ability and desire to creatively develop new technologies.

One of the most difficult tasks is to increase the productivity of labor by the method of internal marketing of the personnel of the enterprise, which puts forward a new task – the identification of reserves and factors of productivity growth on the basis of determining its real level in the enterprise.

Today, the marketing of personnel is part of the personnel strategy of

the enterprise, which aims at optimal use of human resources, creating conditions for increasing labor productivity, development of partners and loyalty to the company.

As the employee's personality develops, it is necessary to reconcile the market conditions and the interests of the employees of the enterprise, since the development of production largely requires the planning of its personnel, and a qualitatively new level of economic development can not be achieved without the effective use of marketing tools in the process of personnel management.

Problems of personnel marketing are widely discussed in the scientific literature. In the works [1], [4] the complex system of formation of the internal labor market on the basis of marketing has been developed. The authors of the paper [3] investigate the marketing of personnel in the context of the development and implementation of personnel strategy of the enterprise; in work [2], [5] comprehensively disclosed the meaning of the concept of "marketing of personnel" and developed the main provisions of the concept of personnel marketing, separated its internal and external components; [7] considers marketing in the personnel management system as a market strategy focused on labor market analysis with a view to long-term provision of personnel.

Problems of increasing productivity are a constant object of research of domestic scientists. Along with the theoretical positions, conclusions and recommendations provided by domestic scientists, the questions of the quantitative expression of labor productivity indicators, the application of methods and models for the discovery of productive labor at the expense of the human factor of production remain outstandingly worked out. Taking into account the above, the purpose of this article is to model the productivity of labor based on the methods of marketing personnel of the enterprise.

Characteristic of the internal marketing of personnel. The staff of an enterprise is an active part of any process and can actively contribute to the growth of production and development of the enterprise. However, staff can be indifferent to their activities and their own functional responsibilities, to withstand the innovations. To avoid these negative phenomena, effective management of the enterprise is possible only with a coherent combination of elements of external and internal marketing.

Internal marketing of personnel is aimed at maximally effective organization of its activities by creating the necessary working conditions, incentives and motives.

Application of a marketing approach will increase the real impact of the human factor in the process of economic activity. The urgency of this direction is conditioned by the need for interaction between the markets of workplaces, buyers of labor and the labor force itself, as well as the need for improvement of intra-firm personnel regulation [3; p. 168].

Personnel marketing should be considered as a system, the main elements of which are the external environment (labor market, recruitment, public policy in the field of education and employment) and the internal environment (adaptation, training, development and evaluation of personnel, organization of the system of motivation and remuneration, delegation of authority, communication and information flows).

A personnel marketing is considered from the standpoint of external and internal marketing. External marketing of personnel is a condition for the growth of human resources through the search and attraction of the necessary resources from the external resources of the necessary labor force. At the same time, the other target group - existing personnel and internal aspects of the activity, connected with the development of available personnel, motivation, involvement in production, increase of productive labor force, remain unnoticed.

From the positions of the second direction, "marketing of personnel should ensure the optimal use of human resources by creating the most favorable working conditions, which will result in increased efficiency, professional development and professional qualification promotion of the worker" [8].

Particular importance of the use of internal marketing personnel acquires in the conditions of the economic crisis. When companies are limited in their ability to engage external personnel, the focus on personnel management using the elements of marketing personnel should focus on employees already working in the enterprise. Particular attention should be paid to retaining existing staff at the enterprise, because in the case of neglecting the aspects of external marketing of personnel, which should complement the internal marketing of staff, the integrity of the marketing itself of personnel at the enterprise is lost in any conditions.

In this case, marketing of personnel involves the use of marketing approach to employees. This means encouraging, coordinating and staffing for effective implementation of enterprise strategies, on the one hand, and meeting the needs of employees on the other.

Consequently, internal marketing of personnel is a necessary kind of activity with the management of existing personnel, and especially in such aspects, which have always been relevant in enterprises: improving the productivity of labor, motivation of personnel and its development. From these positions it is relevant to determine the factors of increasing the productivity of existing personnel of the enterprise and to identify the reserves for its growth.

A personnel marketing is a type of management activity, so it performs a number of important managerial functions. There are three functions: informational, analytical and communicative. According to analytics marketing staff processes all the information and prepares new information for management decisions to develop the necessary measures to increase the competitiveness of the company and its market [6; p. 114].

Methodology. The need to study the factors affecting the process of labor and production is dictated by continuous technical and organizational progress. In order to determine the dependence of labor productivity on factors influencing it, a multivariate analysis was carried out at the enterprise.

To construct a mathematical model as an optimization parameter, the output per one worker (*Y*), and the indicators that influence it are taken.

The method of expert evaluation highlighted seven factors whose impact on productivity turns through performance indicators:

- coefficient of stability of personnel (*X1*);
- coefficient of useful use of working time (*X*2);
- employment rate of workers (*X3*);
- the share of workers with higher and secondary education (*X4*);
- coefficient of employment of workers by qualification (*X5*);
- average qualification level of workers (*X6*);
- social and professional structure of workers (*X7*).

For the construction of the mathematical model data from the industrial company “Litma Ltd” for the last three years by quarters was used. The enterprise produces high-quality products of a wide range. The technical base of the enterprise consists of high-tech equipment of foreign production, including robotic complexes.

As a result of the correlation analysis, we obtain the equation of multiple regression, as well as the coefficients of pair correlation. Calculations have shown that the correlation between the indicators is strong (R = 0,9079) and the model accurately reflects the investigated process.

Among the individual factors, the greatest influence on productivity is the *X2* coefficient of use of working time (Table 3.2).

Table 3.2

Coefficients of pair correlation

Indicators of staff performance	*The value of the pair correlation coefficients*
Stability of personnel	0,702335
Useful working time	0,881768
Employment of workers	0,10368
Workers with higher and secondary education	-0,56132
Use of workers by qualification	0,394694
Use of workers by qualification	0,72692
Social-professional structure of workers	0,468516

Source: Author's Development

In terms of increasing production of middle level workers *X6* negative impact on productivity (r_6=-0,73). Negative influence also has a share of workers with higher and secondary education (r_7=0,47). Other factors *X3* (employment coefficient of workers) and *X5* (coefficient of employment of workers on qualification) – affect labor productivity to a small extent (r_3=0,10 , r_5=0,39).

In the data array there is a multicollinearity (a strong close correlation relationship) between the factors *X1* and *X2* (rx_1x_2=0,81), indicating the presence of multicollinearity between these factors. To eliminate multicollinearity in the data array between factors *X1* and *X2* (r_{x1x2}=0,81), a decision was made to exclude from the model of the factors *X1* and *X3*.

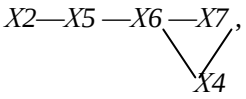
In view of the foregoing, a new linear multivariate econometric model is constructed:

$$Y=-14,20882+13,07029X2+39,1023X4-2,52175X5-8,219667X6+44,53334X7 \quad (3.1)$$

The analysis of the model shows that the factors *X5* and *X6* negatively influence the conditions of the enterprise on the output. Indeed, the higher the qualification of the worker, so his work is less specialized and more universal than workers with lower qualifications, which causes a negative impact on productivity. A similar trend takes place in relation to factor *X6*.

Multi-factor labor productivity models allow us to conclude on the impact of the totality of factors in general, on the change in the level of

productivity when changing each of the factors. Application of these models allows to calculate reserves of productivity growth, to develop measures for improvement of personnel management of the enterprise. In addition, modeling helps to see the general picture of the phenomenon and quantify the role of factors and their interaction. The factors of the model (3.1) form a chain graph,



the length of the path in which it is expedient to reduce using the means of successive seizure of factors.

The coefficients of the model characterize the degree of influence of factors on output Y. In this case, the absolute numerical value of the coefficient *bi* shows the rate of change of *Y*, depending on the factor investigated by *Xi*. The analysis of the signs before the coefficients *bi* specifies the path of the *Xi* control for the purposeful change of output *Y*. In the resulting model the maximum numerical value has coefficients *b4* = 39,1 and *b7* = 44,5, hence for the studied region. The most significant socio-occupational structure of workers in the number of industrial and production personnel.

Results and Discussions. Thus, according to the results of the analysis of the obtained regression model, we see that it is not necessary to support the use of working time within the limits of 93,10% to increase the productivity of workers and the utilization of skilled workers for – 0,94. Average qualification category of workers should not be higher than 3,72, and the share of workers with higher and secondary education should be increased to 36%. The social-professional structure of workers should be at the level of 74,5%.

The proposed model adequately describes the economic phenomenon. The coefficient of the multiple correlation is 0,91, and the determination factor is 0,82, that is, 82% of the variation in labor productivity is due to the effect of the investigated factors.

The adequacy of the model is estimated using Fisher's F criterion, the actual value of which was 5,63, and the F-table – 5,4. Since the actual F is greater than *F* of the table (critical), then with a probability of 0,95 it can be argued that the mathematical model is adequate to the statistical data.

For graphic interpretation of graphs polynomial model number for productivity (Figure 3.4).

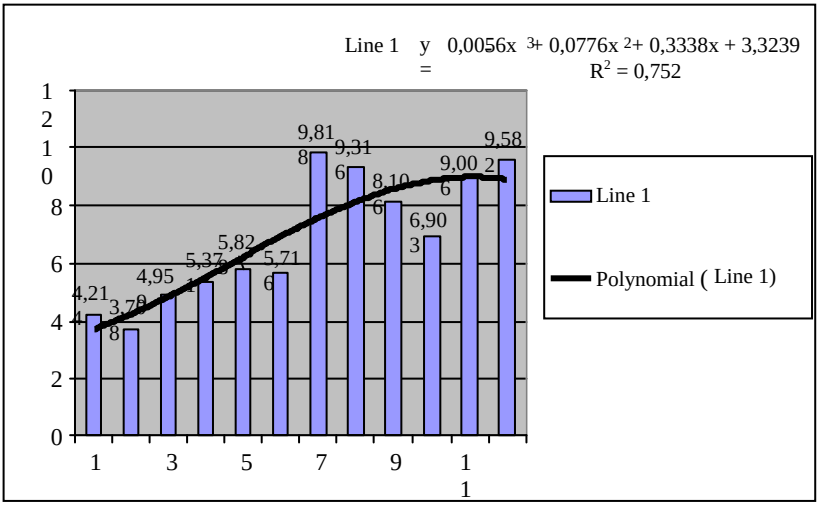


Figure 3.4 Function of productivity

In Figure 3.5 shows the impact on the productivity of the coefficient of useful use of working time and the proportion of workers with higher and secondary special education.

From the figure, it can be seen that the productivity of labor affects the use of working time proportionally, and the proportion of workers with higher and secondary education has a nonlinear effect.

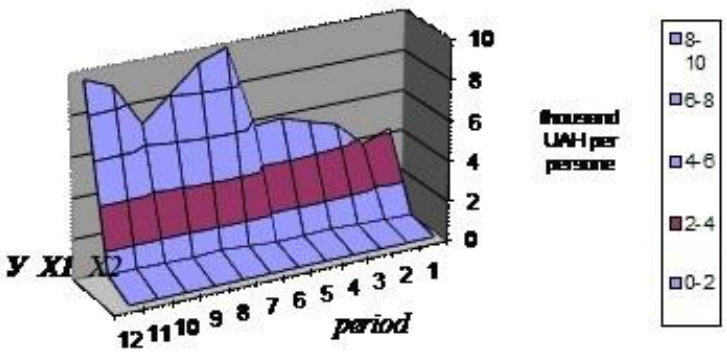


Figure 3.5 Dependence of labor productivity on the use of working time and the proportion of workers with higher and secondary education

Figure 3.6 shows the dependence of labor productivity and the use of working time, from which it is evident that both indicators tend to increase.

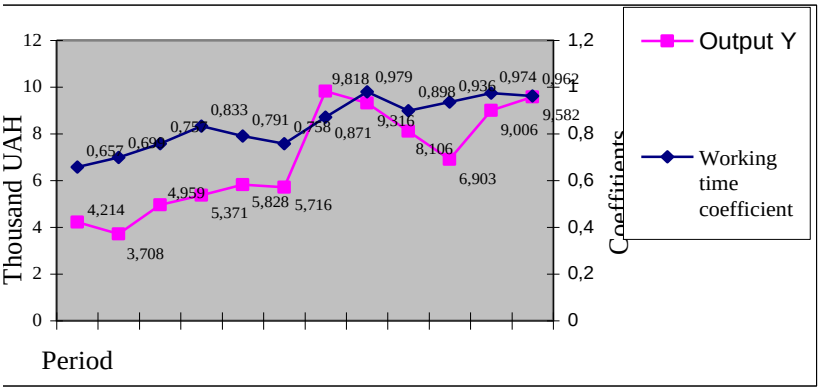


Figure 3.6 Dynamics of labor productivity and working time coefficient

The figure shows that the optimal value of the coefficient of use of working time should approach 0,9, which will ensure the growth of labor productivity.

The dependence of labor productivity on the proportion of workers with higher and secondary special education is shown in Figure 3.7.

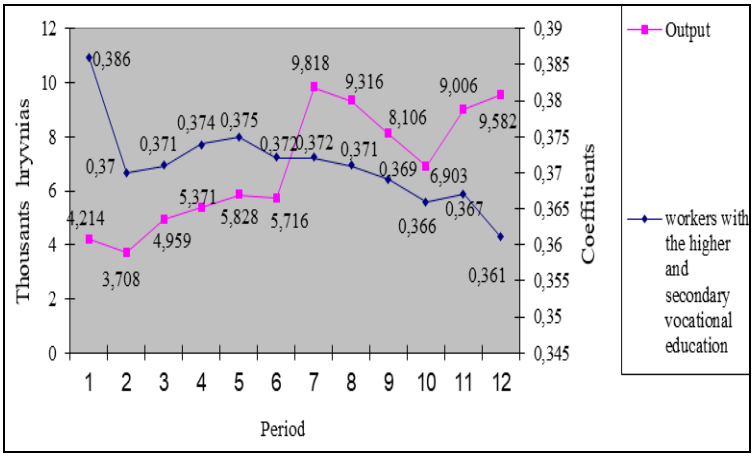


Figure 3.7 Dependence of labor productivity on the proportion of workers with higher and secondary special education

At the enterprise there is a tendency to reduce the proportion of workers with higher and secondary education, as such work for highly skilled workers is unattractive. However, productivity increases, because it depends largely on output core workers, whose work does not necessarily require higher education. The optimal level of this indicator should be 40%.

In Figure 3.8 depicts the dependence of labor productivity on the coefficient of employment of workers by qualification.

In the investigated period, the coefficient of use of workers in qualification is more than one. This indicates that the entire potential of the workers is not fully utilized in the enterprise, that is, they carry out less qualified work than they could, and thus lose interest in increasing labor productivity.

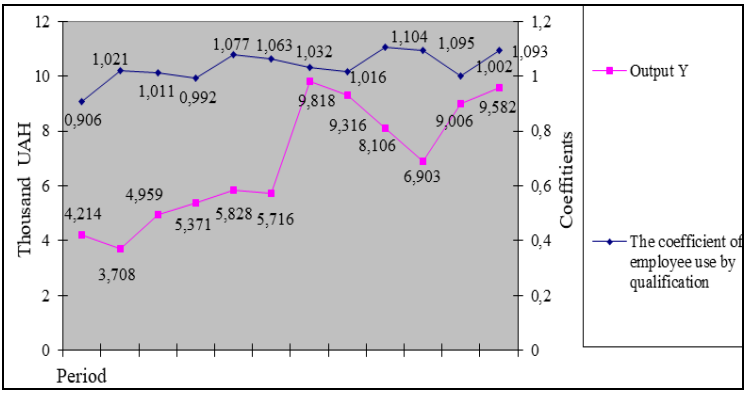


Figure 3.8 Dynamics of labor productivity use of workers by qualification

The dependence of labor productivity on the average qualification level and the socio-occupational structure of workers are shown in Figures 3.9 and 3.10.

In the studied period there is a decrease in the average qualification level of workers, while improving the social and professional structure of personnel, which affects the growth of labor productivity.

Conclusions. The results of modeling the factors of productivity can make the following conclusions:

– the first stage of simulation showed that among the selected factors, the coefficient of use of working time and the coefficient of stability of personnel are most influenced by productivity;

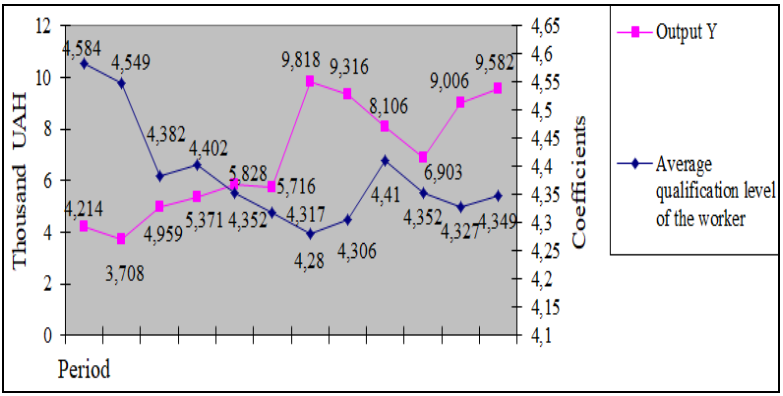


Figure 3.9 Dynamics of productivity and average qualification level of the worker

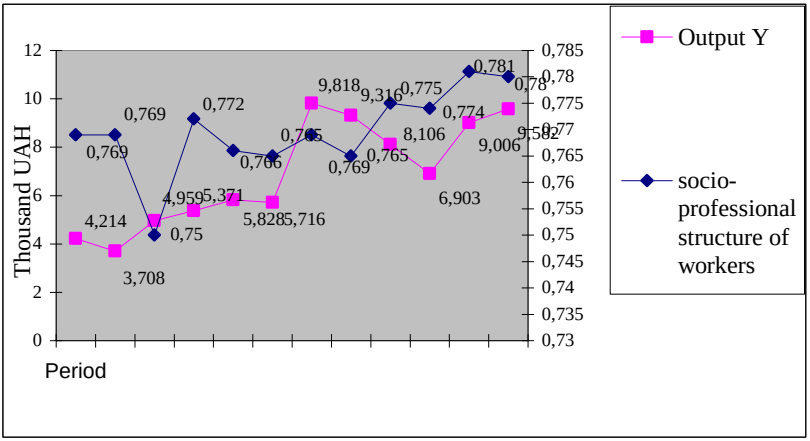


Figure 3.10 The dynamics of labor productivity and the socio-professional structure of workers

– found that for improving productivity of workers necessary to provide such levels investigated factors: use of time – within the 93,1% utilization rate for skilled workers – 0,94, the share of workers with higher and secondary education – 36% of social-professional structure of workers – 74,5%;

– assessment of the reliability of the results can be asserted with a probability of 0,95 about the adequacy of the model under study.

The proposed mathematical model is not a standard that is fully suitable for any industrial enterprise. In each case must be considered specific. Not exhausted in this paper and scope of activities for methodological improvement of this system. However, determining the level of social development, its potential, as well as the impact of individual factors on labor productivity is necessary in order to identify the reserves of its growth. The results of this modeling will provide valuable practical recommendations regarding the conditions of activity and the specifics of the functioning of specific enterprises, to develop certain targeted measures to enhance the factors of productivity increase on the basis of the numerical values of their influence. It is important to have the active participation of personnel in the process of improving productivity, developing his intellectual abilities of innovative and creative skills in terms of business innovation and development of science and technology.

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