# SOCIAL FACTORS OF MODERNIZATION AND TRAINING PROGRAMS

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## ABSTRACT

In the article presented, the role of social factors in modernization of Russian Railways is considered, with special attention paid to improving the effectiveness of training of personnel of linear enterprises based on the strategic approach and the concepts of institutional economic theory. The strategic map, built for target tasks, is proposed to be used as a tool for formation of actual training programs, which should be correlated with actual production indicators.

*Keywords: personnel education, schemes of institutional changes, social factors, modernization, JSC Russian Railways, training programs, strategic maps.*

**Background.** *Since the 1980s, the majority of Nobel laureates in economics are scientists who have become supporters of the new institutional economic theory. Theoretical research in this area allows to take a fresh look at the problems of the domestic economy as a whole, and the problems of development of Russian Railways in particular.*

*In the middle of the last century Armen Alchian [1] put forward a theory, according to which, as a result of the competition of institutions, the most effective ones survive, which determines the progress of countries and organizations. However, a few years after its publication, due to cliometrics (a science using quantitative methods in the study of history), it turned out that the theory of progress is controversial, in the history of mankind the periods of progress are followed by periods of stagnation or regression. It became obvious that not all technological, organizational, social innovations lead to development, and moreover – the same innovations in different institutional settings give not just different results, but sometimes the exact opposite. Hence the need to explore not only the direction of development, but also its sources for various organizations.*

*Now it is common to consider two schemes of institutional changes that lead to progress and allow modernizing the social system. Both schemes have much in common, but what fundamentally distinguishes them is the source of development.*

*The author of the first scheme of institutional changes was the American economist Harold Demsic [2]. In his works, he put forward the idea that the source of development of the organization is the external impact, which takes it out of homeostasis and makes it move forward.*

*The second scheme was developed by the 1993 Nobel Prize winner Douglas North. In his work «Institutions, Institutional Changes and the Functioning of the Economy» [3], and also in the book «Violence and Social Order», written in conjunction with John Wallis and Barry Weingast [4], he examines the internal sources of development in the organization and concludes that such a source is training. North writes: «Maximizing goals of the organization, conditioned by the institutional system, I'm going to unite in one with the development of the stock of knowledge» [3, p.101].*

*The author of the idea notes that the development of the organization, conditioned by accumulation of knowledge, occurs incrementally, gradually, without sudden leaps. However, in our view, the scheme of institutional changes proposed by him opens up opportunities for a purposeful modernization of the organization through managing the development of social factors, in particular, the process of training the company's personnel. Moreover, proceeding from the concept of North, it is the development of social factors that becomes the only direction that can lead to modernization of the organization.*

**Objective.** *The objective of the author is to consider social factors of modernization and training programs.*

**Methods.** *The author uses general scientific methods, comparative analysis, evaluation approach, scientific description method.*

**Results.** *JSC Russian Railways is the largest transport company in the world, which has been in a state of reform since 2004. At the same time, the main focus of the holding's strategists has so far been on technical development. Although it should be noted that traditionally much attention is paid to training of personnel. In many respects, the system of advanced training has been preserved since the pre-reform period, when the railway functioned within the framework of the Ministry of Railways. During 12 years of the reform, some of its important elements have been lost, for example, higher education institutions have been transferred to the Ministry of Education and Science of the Russian Federation. However, even in the crisis years, considerable funds were allocated for training purposes [5].*

*The main regulations for JSC Russian Railways in this area are:*

*– Order of JSC Russian Railways dated 31.12.2009 No. 2757r «On implementation of the quality standard in the process of personnel management «Training and professional development» [6];*

*– Order dated December 11, 2014 No. 2940r «On approval of the standard «Organization of technical training of employees of JSC Russian Railways. General provisions» [7];*

*– Order dated April 17, 2013 No. 907r «On approval of the Regulation on organization of vocational training in JSC Russian Railways» [8];*

*– Order dated September 22, 2014 No. 2207r «On approval of the Regulations on organization of holding qualification exams for vocational training of workers and employees in the training centers of branches of JSC Russian Railways [9].*

*In order to answer the question whether the efforts made are effective, whether they allow to accumulate knowledge and implement them in the process of the holding's development, we will examine the processes of personnel training at the operational level and their connection with the results of the activity of linear enterprises.*

*Under the effectiveness of training we will understand the extent to which the learning objectives have been met. We believe that the goal of personnel training should be to improve the qualitative and quantitative characteristics of the enterprise.*

*As an object of research, the author chose Moscow-Rizhskaya maintenance section (PCh-16), which is a structural subdivision of Moscow Infrastructure Directorate. The line is divided into three sections: Moscow-Rizhskaya–Nakhabino, Dedovsk–Rumyantsevo, Chismena–Shakhovskaya. Workers of these sites serve 298,547 km of main tracks, 134,516 km of station tracks, 19,5 km of access roads. As of January 1, 2016, the staff number of the company was 374, of which 333 (88 %) are workers, 22 (6 %) are managers and 19 (6 %) are specialists. Over the past three years, the number increased by 42 people (12,7 %) due to the increase in workers' number.*

*The maintenance section is not accidentally chosen for this study. This is one of the few divisions of the holding, where assessment of activities is carried out with the help of technical means, which excludes the influence of human factor and can be regarded as an objective characteristic, which is important in justifying the conclusions.*

*To determine the indicators of the state of the track are used: track patterns, track-measuring bogies and cars, levels, theodolites, tacheometers, electronic tacheometers, GPS-receivers. The main means for continuous systematic monitoring of the track are track-measuring cars. The measurement results are recorded simultaneously on two paper strips. The computational complex of the track measurer consists of three PC, united in a local network.*

*The border marks pickets and kilometers. In addition, the new track measurer TsNII-4, with a working speed of 160 km / h, controls gradient and profile marks, acceleration of the body and axle boxes, location of reference points, speed of movement and the distance traveled. It includes a hardware-software control and computer complex, which allows to decode records automatically.*

*Each kilometer is assessed qualitatively and scoring the state of the gauge, depending on the degree and number of deviations found on it, and on the linear section, at the maintenance section, based on the average number of points obtained by dividing the total score by the number of kilometers tested (Table 1).*

*Score assessment of the track state PCh-16 in 2015 is shown in Pic. 1.*

*From the graph it follows that the score assessment exceeds the levels established by the plan, both for the enterprise as a whole and for the individual site.*

*The dynamics of the score assessment for three years as of March 1 is presented in Table 2.*

*It follows from the table that in 2014, according to the score assessment the plan was 100 % complete, in 2015 the deterioration of the score assessment was 43,3 % compared to the plan, in 2016 the gap increased – deterioration in the score assessment was 80 % compared to the plan.*

*Let's consider, how on a background of the general industrial picture the personnel training in Moscow-Rizhskaya maintenance section is organized.*

*As a structural unit, Moscow-Rizhskaya maintenance section (PCh-16) is included in the system of advanced training of the holding's personnel.*

*The main organizer of training is a training engineer. To improve the skills of linear personnel, he uses four main types of programs:*

*– primary training;*
*– retraining;*
*–training in the second (related) profession;*
*– advanced training of workers.*

*During the study period, the number of trained in PCh-16 grew from 59 people in 2014 to 101 in 2015.*

*Pic. 2 presents an analysis of the number of workers who have been trained in the forms of training for the period 2014–2015.*

*As follows from the diagram in Pic. 2, the basic directions of training of workers were targeted purpose courses, the increase of trained here was 61 %. This trend may indicate the reaction of the leadership of PCh-16 to the deterioration of score assessment, an attempt to improve the performance of the enterprise by improving the skills of workers. This conclusion is confirmed by an analysis of the structure of trained workers by profession, presented in Pic. 3.*

**Table 1**

**Qualitative and grade assessment of the state of the track**

| Qualitative assessment of the state of the track gauge | Score assessment of kilometer | Average value of scores on a linear section, at a maintenance section |
|---|---|---|
| Excellent | 10 | До 25 |
| Good | 40 | 26–80 |
| Satisfactory | 150 | 81–180 |
| Unsatisfactory | 500 | Over 180 |

**Table 2**

**Score assessment of Moscow-Rizhskaya maintenance section for the period 2014–2016**

| March 2014 | | March 2015 | | March 2016 | |
|---|---|---|---|---|---|
| Plan | Real. | Plan | Real. | Plan | Real. |
| 33 | 33 | 30 | 43 | 30 | 54 |

*As follows from the diagram in Pic. 3, in the structure of the trained track servicemen are dominant. A sharp increase in the number of trained, almost three-fold, occurred among foremen, which indicates that the leadership of PCh sees problems in organization of workers' labor and tries to eliminate them by improving the skills of down management.*

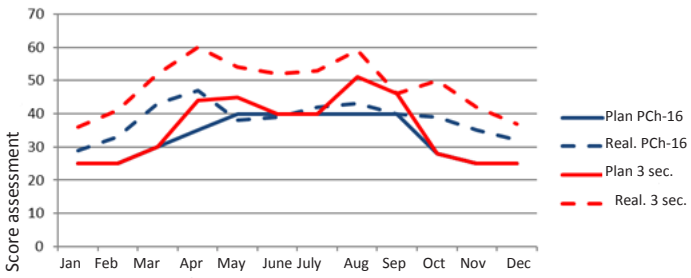
*In general, we see, on the one hand, a tendency to deterioration of performance of the maintenance section, on the other, an increase in the number of people trained at the enterprise.*

*The conducted research revealed inconsistency of the system of professional training of the linear personnel with the purposes of development of the maintenance section. And there is a reason to conclude that the current system of accumulating knowledge is not very effective.*

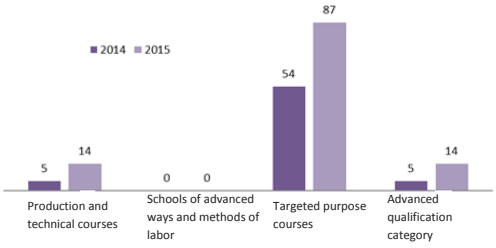
*In order for the training of linear personnel of the maintenance section to be directed to development of the enterprise, it must be included in the operational strategy and linked to the organization's goals by cause-and-effect relationships.*

*As a tool for defining and formalizing the tasks of social development, in particular the tasks of training personnel, a strategic map can be used in the structure of the enterprise development objectives.*

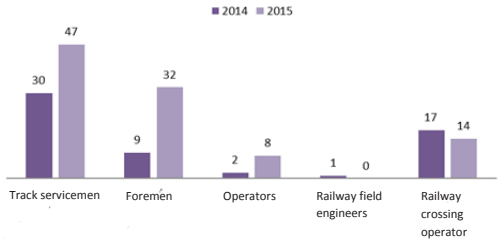
*The strategic map is a way of visualizing a balanced system of indicators that builds target indicators of the company's activity in a hierarchical structure with clearly defined cause-effect relationships. The authors of the methodology are Robert Kaplan and David Norton [10, 11], who were the first to draw attention to the fact that the evaluation of the company's activity only in the system of financial indicators does not allow identifying causal relationships between the efficiency and state of the organization's resources, and therefore does not*




***Pic. 1. Score assessment of Moscow-Rizhskaya maintenance section in 2015.***




***Pic. 2. Analysis of the number of workers who have undergone advanced training in forms of training for the period 2014–2015.***




***Pic. 3. Analysis of the number of workers undergoing advanced training by professions for the period 2014–2015.***

*provide opportunities to build an adequate management system. The basis of the new theory was the system of balanced indicators (BIS).*

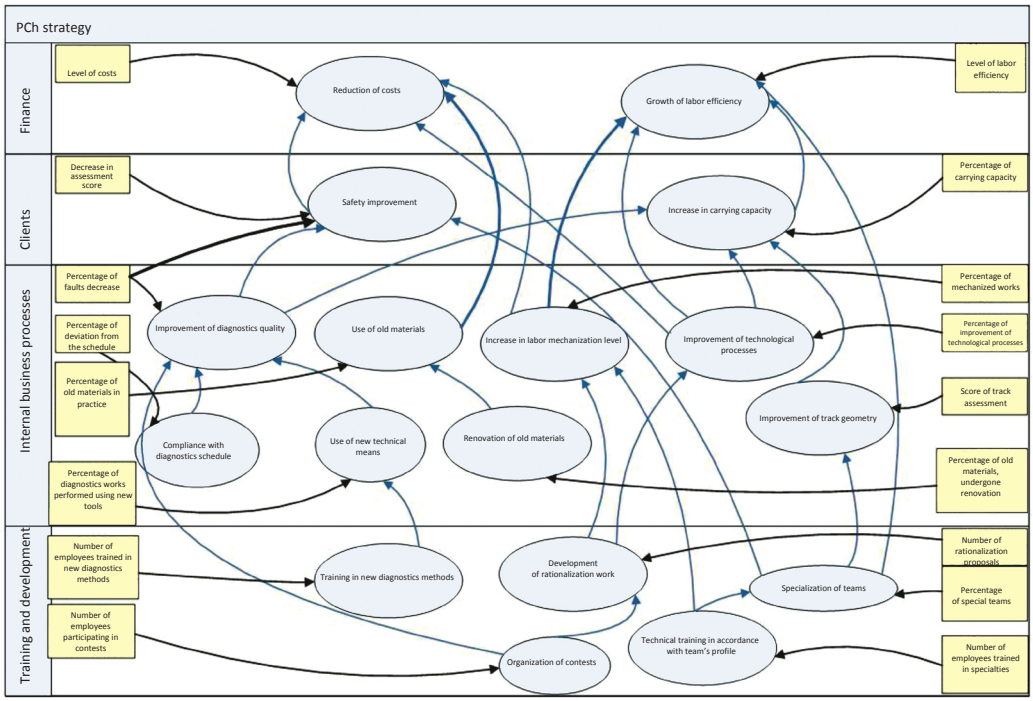
*BIS helps to transform the strategy of any enterprise into a hierarchical graph of goals, objectives and indicators, to streamline the organization's goals and resources through causal relationships built around four levels: finance, clients, business processes, training and development. Four components enable the organization to strike a balance between long-term and short-term goals, between desired outcomes and the factors to achieve them, as well as between rigid objective criteria and milder subjective indicators.*

*With the purpose of constructing a strategic map, a study was conducted among the leaders of track distance (heads and chief engineers) of regional directorates with a wide geography from the Far East to Kaliningrad. The expert survey was attended by 16 people. The study was conducted in the first half of 2015.*

*The strategic map and the corresponding system of balanced indicators are built in the software Business Studio 4.0. It was possible not only to visualize the maintenance section's goals system, to determine the main business processes supporting the implementation of goals, to develop a system of indicators throughout the hierarchy of goals and processes, but also to allocate responsibility for their implementation in the structure of the enterprise and to monitor the implementation of the strategy in a daily mode using the indicator line.*

*During the collective discussion, the experts formulated the development goals at the financial and client levels. When they were formed, the features of the position of the maintenance section in the structure of the corporation were taken into account. The experts called the decrease in operating costs and growth in labor productivity as the main financial objectives. Heads of the linear enterprises consider these directions as the main mechanisms of including the maintenance section in the realization of corporate goals. At the same time, the objectives of increasing revenues from supporting activity of the maintenance section (SAD) as a potential direction of growth of financial indicators were also considered. We will clarify: the potential, as long as there is no mechanism for material incentives for this activity, all revenues from SAD come to the directorate.*

*When determining the objectives of the client level, the peculiarities of the position of the maintenance section in the technological system of the transport company were also revealed. For PCh-16 on the technological chain, the main client is the traffic control service. That is, maintenance sections primarily deal with the internal client. It was noted that in the context of reforming the corporate management system, the coordination of related structures, including infrastructure enterprises and traffic management services, became more complicated. However, in the*




***Pic.4. Strategic map of PCh.***

*process of formation of the cause-effect relationships between the levels of financial goals and client objectives, experts identified the need to maximize the needs of the internal client, which according to the heads of maintenance sections are increase in security and increase in carrying capacity.*

*Based on the objectives of the financial and client components of BIS, the goals and indicators of the component of internal business processes were formulated. It is at this level of the strategic map that the main objectives of the linear enterprise development acquire their final form, which, along the whole set of enterprises of the transport company, determine the directions of its modernization.*

*All three levels of BIS depend on the state of the basic component – learning and development. It is the fourth component that determines the content (attributes) of the organization's social potential and the nature of the goals of the upper levels: development of professional competencies, organizational culture and information support [13–15].*

*The strategic map constructed as a result of the study is shown in Pic. 4.*

*The inclusion of training in the system objectives of the operational strategy of the linear enterprise allows to identify the actual areas of professional training. Similar studies of operational strategies of linear enterprises of other directorates, for example, traction direction [12], have shown that the learning vectors are similar, but they have specific features. Obviously, it is this specificity that helps to form not only relevant, but also directions of accumulation of knowledge adequate for specific technological areas.*

*It can be confidently said that the study revealed the dependence of development of the linear enterprises of the transport company on the state of their social potential, and, first of all, on the effectiveness of the personnel training system. Moreover, there is reason to assert that, in general, for RZD, a causal relationship between the state of social potential and the modernization of the company takes place.*

**Conclusion.** *The use of BIS and strategic maps at the operating level of the linear enterprises of the transport company allows to identify and describe in quantitative parameters the relationship between the level of social potential and the level of development of the organization. That is, at the same time, the postulates of the institutional theory on the influence of social factors on the processes of modernization of the organization are also confirmed in this way.*

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