

PERFORMANCE MANAGEMENT AND TRANSFORMATION OF HUMAN RESOURCES IN STATE-OWNED RAILWAY TRANSPORT OF SERBIA

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Abstract: *The main objective of the study of performance management is to promote and improve the efficiency of employees. This is a continuous process in which managers and employees jointly plan the goals and contribution of everyone. The main management tools are related to identifying areas for improvement; identifying needs for personal and professional development; promoting good achievements. Performance appraisal is based on a predefined set of criteria described in this study.*

The study shows the existence of formally documented strategies and a clear need to raise awareness of the different hierarchical levels. The available level of communication with regard to the monitoring and evaluation systems used also shows that there is a need for improvement and intensification. At the central level, there is a claim that there is a labor assessment system, but the evaluation conditions and the criteria used are poorly transmitted at the next levels of government. Another important area is the assumption and allocation of responsibilities, which has not changed in recent years. The adequacy of the system to the external environment implies changes that are in line with the inevitable commercialization of Serbian railways.

In order to record as-Is situation on Performance management, and to propose upgrade on the existing methodology of a continuous process of planning, monitoring and reviewing employee performance, a study was realized. The main objective was to provide sufficient information for analysis which enabled to develop a performance management plan based on a key indicator system. As-Is analysis findings, cross-referenced with the best practices have determined a particular “gap” level. In order to overcome the gap were developed guidelines, optimally adjusted for state-owns railways of Serbia.

The main results of the study are related to a description of the necessary requirements for successful performance management, including organizational, procedural prerequisites and necessary functional skills and competencies of the supervisors. A system of key indicators for functional monitoring of the effectiveness of the human resource management process is also proposed. Primarily to determine the quality of the KPIs we defined, we have conducted Data Envelopment Analysis (DEA).

The study ends with the following conclusions: to build further work on human resource transformation, namely improving information and coordination of information at different hierarchical levels by optimizing the communication system; optimizing the system for allocating responsibilities for increasing labor productivity; updating the system for monitoring, evaluation and compensation of labor. Achieving a good Success Management system is possible when performing a series of activities such as: design and validation of an adequate system of objectives; Restructuring the economic subsystem and functional redistribution in line with the enterprise’s objectives; development of a functional specification for the digitalization of the performance management.

Keywords: *HR transformation, performance management, digitalization, railway.*

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1. INTRODUCTION

Work performance management requires multidimensional approach at multiple levels of organizational structure. Basic example of measurement of work performance of the company itself are the financial indicators and relations between the financial indicators and turnover indicators. Performance can be measured at the level of organization, at the level of organizational units, at the level of working teams and at the level of an individual (employee). Common practice is that the organizational part dealing with finances, i.e. planning and analysis, generates and presents reports which provide answers to question of performance of the entire organization. However, this cannot be regarded as separate information, but as a presentation of business results, in addition to which, and within which additional indicators are considered as well. The issue of performance of individual organizational units is usually dealt by company management through planning, organization, coordination and control, i.e. monitoring of results which a particular organizational unit is accomplishing. In addition to these indicators, series of methods are developed to quantify indicators in various fields. One example is the employee engagement index (elaborated hereinafter) which is used to determine the quality approach to human resources management within the company. Another example is the series of indicators which follow the process approach, i.e. these lead to the evaluation of effectiveness of implementation of individual activation of a business process. Combination of financial results and metric methods dealing with employees, thereof motivation or dedication allows for the top management of the company to make well-informed decisions and take steps which will result in increased productivity, higher motivation and reduced employee turnover.

Employee performance management, requires a comprehensive approach which starts from strategy, goals and plans of the organization which are elaborated to the level at which an individual (employee) can provide personal contribution, i.e. to the level at which personal contribution can be assessed. On the other hand, goals set for individuals rest on the job description, and the result of application of performance management methodology should be employee development, thereupon obtaining of information to generate annual training plans as well as improvement of the overall efficiency level while accomplishing company goals.

2. PERFORMANCE MANAGEMENT

The main purpose of performance management is to promote and improve the efficiency of the employees. This is a continuous process where managers and employees jointly plan the goals and contribution of each to the enterprise. An effective performance management system includes:

- Assessment of employees' contributions to company plans,
- Identification of areas for improvement,
- Identification of the needs for personal and professional development,
- Promoting good achievements,
- Defining work and career goals,
- Adjustment of wages.

Performance control is implemented based on plans and current job descriptions. Performance appraisal stands on pre-established set of criteria known to both parties, and its result is reflected in a written document.

Performance management is an ongoing process guided by the principles of positive attitudes towards employees and aiming to maintain high efficiency and give employees clear feedback on their work. The main function of this process is early detection of problems, before work results of employee have a negative impact on the enterprise or on the person.

The development of an effective performance management system is based on certain areas of human resource management, the most important of which are:

- Clear and precise written job descriptions,
- Clear hierarchical structure and effective supervision,
- Positive working environment as it is demonstrated by Figure 1.



Figure 1: Working environment

In addition to the development purpose, performance management also has a corrective dimension, i.e. it enables influencing the skills, knowledge and competences of an individual through various corrective measures. Well-arranged system which minimizes subjectivity in evaluation enables identifying weaknesses in knowledge, skills and employees' attitude to work and, based on that, taking of corrective measures, including the measures provided for in the Labor Law (LL).

Performance management is one of the most important tools for human resources management. Based on the analysis of the current regulations, and in view of creating conditions for increasing the efficiency in work and improving the working results of employees, the expert team deems that it is necessary to develop a new performance evaluation and management system, based on best practices and experience in this field.

Evaluation of the available information among the employees that will participate in the development and implementation of the performance management system was done by using the specialized questionnaire prepared by the consultancy team.

In proposing the elements and sequence of activities for the preparation of the performance management plan, the consultancy team applied modern performance planning methods (goals setting, periodic, i.e. semi-annual review and annual evaluation of accomplishment thereof), all being tailored to the organizational structure of the Company.

The team also prepared a proposed sequence and schedule of activities for the development of performance management system with determined steps, from the launching to the implementation of the performance evaluation system.

The 15 selected Key Performance Indicators (KPI) are presented, which are intended for monitoring of the development of human resources and of the impact of the performance determination mechanisms, and the Company may also use other indicators which it deems appropriate for consideration and guiding of activities for determination, management of performance and human resources development.

2.1. Questionnaire

For purposes of analysis, we prepared a specialized questionnaire [5], [6]. The main objective of the questionnaire was to provide sufficient information, the analysis of which will enable the consultant team to develop a performance management plan (based on a key indicator system) at the highest possible professional level. This plan will provide opportunities for decisions-making in human resources management and will be the basis for developing a labor development plan.

The main sections in the questionnaire, which indicate the areas for decision-making are the following: strategy and corporate policies; development of staff; payment and remuneration; labor relations and communications and organization data.

The questionnaire was completed at two management levels (Central and Regional) in the Freight railway operator, passenger railway operator and infrastructure manager, by executives and leading experts in human resources and administrative management, as defined by the consultancy team. A specially developed methodology is used to process the results. The questionnaire includes 34 indicators, divided into 5 groups. The weights of individual groups of indicators are determined by an expert team taking into account the number and interrelation of the individual indicators as well as the reliability of the information.

Comments received from beneficiaries were also taken into account. The basic logic of weighting is that important (relevant indicators) for which reliable information is available should be given a relatively high weight, while the importance of the indicator and / or the reliability of the data is reduced, and the burden is reduced. Less important indicators receive little weight, even when they are very reliable, because their significance for the assessment is not great. Even the most important indicators can also be low in weight when their measurement is not reliable enough because the information thus obtained hides some uncertainty and does not have to be decisive.

Conclusions:

- 1) Improve awareness and coordination of information at different hierarchical levels by optimizing the communication management system;
- 2) Optimize the system for allocating responsibilities to improve labor productivity;
- 3) Updating the system for monitoring, evaluation and compensation of labor - it is crucial to introduce an evaluation system that evaluates the individual contribution to the company's results;
- 4) Optimization of the training and retraining system for staff.

2.2. Goals setting

Setting up the system of goals is a key element of the enterprise management system. We have analyzed the system of objectives presented in the official documents and have once again identified some imperfections. As described in the methodology above to ensure maximum efficiency, goals need to be in line with some basic requirements. They should be *Concrete, Measurable, Realistic, Relevant* and *Bound in time*.

The analysis shows that there is much work to be done to bring the system of objectives into a position that can ensure a sufficiently high management efficiency of both the enterprise as a whole and the performance management that is an essential element of governance of human resources. We recommend starting a procedure to develop a new system of objectives, consistent with the main goals of Serbia's railway sector reform. It is appropriate that work be based on the following system of strategic directions for development: Enhancing competitiveness; Improvement of accessibility; Reduction of adverse environmental impact. Annual goals of the Companies which steer the manner and scope of implementation of individual strategic goals for that year are to be set in the business programme for specific year based on strategic goals.

Horizontal alignment between goals is ensured by single origin – goals of director general and executive directors, which are based on strategic goals and goals set in the annual business programme. Manner of setting of goals of managers of every other management level (each manager initially prepares his own goals, but they are definitely set after consultations with and approval by the superior manager) further ensures thereof horizontal alignment.

Vertical alignment between goals (by hierarchy) is ensured by referral or taking over of goals by “cascading”.

“Referral by cascading” is initiated by the superior manager who “refers”, for operationalization and implementation, to the manager of lower hierarchical level or to the employee a goal or part of a goal from his own goal plan and the latter is obliged to regulate this by setting his own goals.

“Taking over by cascading” of goals has the same purpose and result, but, by this approach, the employee has an insight into the goals of the superior manager, takes over a goal or a part of a goal relating to his scope of work and sets his own goal(s) based on that.

Once a manager's goal is cascaded to a lower level manager or employee subordinate to such manager, the manager and his subordinates are completely aligned in respect of the goal which is to be accomplished and the manner in which it will be accomplished.

Finally, alignment between goals is ensured through mandatory consultations with superiors during the goals setting process.

2.3. Key performance indicators for monitoring

There are numerous key performance indicators [10], that can be used for measurement of HR management process efficiency, or HR approach suitability. The goal is to choose such combination of indicators that will adequately present as-is situation and enable employer to determine

reasons for potential discrepancy. The most important presumptions are that representative indicators are used and that the proper set of HR data is analysed.

Comprehensive analysis should be performed in the initial phase and it should encompass the following groups of indicators: Motivation indicators; Recruitment and selection indicators; Basic salary ratios; Effectiveness of work; Employee development.

Motivation of employees and motivation indicators

Motivation measures applied to employees should be financially considered through total amount invested in someone's salary, incentive, training, improvement, development of communication and loyalty. This should be monitored by individuals, and it is necessary to separately monitor how much was invested in individuals who asked for termination of employment. Every unwanted leave of an employee represents cost for the employer and this is obviously due to the money and time which will be dedicated to finding adequate person for the job and training which this person will need. It is estimated that the cost of replacement of an employee who left the company ranges between 3 and 6 monthly gross salaries, and in some cases (where, due to the nature of the job, great investments are required for training and qualification of the employee) cost can be significantly higher. Employers who invest more in the employees and in their development reduce the possibility that employee will leave, and, on the other hand, increase the potential loss in case that someone who was invested in leaves the company. Period which employee spends working with the employer is one of the indicators, thereafter churn rate is also used, as well as structure of employees who "left" the company, dedication and satisfaction of employees. All these indicators are to be observed, analyzed and presented to the company management by the organizational segment in charge of human resources management.

- Indicator 1 - average employee tenure,
- Indicator 2 - employee churn rate,
- Indicator 3 - employee satisfaction index,
- Indicator 4 - employee engagement index.

Other forms of surveys, combining closed and open format questions, can also be distributed in written format and left in special boxes (to keep it anonymous), but if the data is collected in written form additional statistical analysis of the questionnaire is required.

It is important to note that survey questionnaires require serious analysis, feedback and action. If employer receives the information from the employees, this should be addressed. Also, employees should receive clear feedback if something is improved or resolved, or a feedback that it is not possible to react. All of this is equally important, and if there is no willingness to take any measures, it is better not to conduct satisfaction surveys. Lack of reaction on survey results can negatively influence the overall motivation, and future response rates.

Recruitment and selection efficiency indicators

Recruitment and selection are the initial step of all processes indirectly or directly related to human resources management. The text here below addresses several indicators through which the employer may notice regularities and develop proper measures if reaction is needed. Note that recruitment of staff is highly influenced by market and demographic situation, and that the employer can only work on increasing the level of organizational culture and promotion among

the members of population he regards as prospective employees. This work requires strong efforts and dedication, and results are visible only on the long run.

Indicator 5 - average applications to open posts (example of recruitment efficiency indicator),
Indicator 6 - time to hire .

Although the market situation is currently favourable for employers, when selecting the key engineering staff, there is a problem of competition with foreign companies which offer financially more attractive packages for experienced employees.

Cooperation with schools and universities, provision of large number of certifications and professional trainings because of which the candidates for whom this is the first employment could be most interested in this system. On the long-run, it is possible to provide various development programs etc.

Recruitment success indicators will be clearly and numerically presented through the evaluation of performance of new employees. This indicator can be considered only when we will have grades for the period of at least 3 years (because individual's potential for learning and advancement will be expressed during such period). Some measures of satisfaction of new employees with the company and the specific job they perform should be taken into account.

Basic Salary Ratios

Indicators whereby salary is analyzed are usually considered as basic indicators. They are easy to calculate; data are available and comparable with market data. It is common for the employer to consider these indicators at least once a year (before budgeting).

Indicator 7 - executive to employee pay ratio,
Indicator 8 – salary competitiveness ratio.

Effectiveness of Work

Effectiveness of work is a combination of ratios gained from the available HR and financial data. Since this metric is precise, the data is known and available it is useful to consider it together with periodical financial reports.

One of the indicators in this group is HSE process indicator (Time lost to accidents and injuries) and it can be easily converted in financial value. It is necessary to point out that HSE processes are key support processes and that the goal is gaining absolute level of HSE dedication and protection.

Indicator 9 - human capital value added (hcva),
Indicator 10 - revenue per employee (rpe),
Indicator 11 - time lost due to accidents or injuries.

Other HR process efficiency indicators

Training efficiency and performance management require special analysis. Performance management and training efficiency are cornerstones of the Talent Management approach. All of

this significantly influences employee satisfaction rates. Additionally, one of the absenteeism indicators and simplest indicator of organizational culture (diversity) are presented for further application.

Indicator 12 - performance review completion ratio

First of all, it is necessary to emphasize that, on the global market, companies are striving to shift from the annual evaluation system to permanent monitoring, more frequent interviews with employees and provision of feedback on the work as soon as possible (not only periodically). These postulates are based on the fact that feedback on work should be timely, specific and realistic. By this we only wish to emphasize once again the general importance of evaluation of performance for individuals and the company. In the systems where periodical evaluation is used, it is necessary to monitor the number of completed templates and to strive that it reaches 100%. In order to ensure that everyone is evaluated, it is necessary to link the performance evaluation with awarding, advancement and professional development, and, in addition, it is preferred to set to the assessors one managerial goal which includes provision of feedback on work and employee career leading.

Indicator 13 - training return on investment

Besides the training return of investment effectiveness and quality of training should be regularly measured and included in training methodology.

As training of employees is long-lasting and cost-intensive category, this requires analytical and dedicated approach and monitoring of all steps of professional training cycle.

In general, effects of return of this type of assets are measured through advancement of employees whereof development is invested in, thereafter through successful retaining of such employees within the company and through increase in the overall level of knowledge and skills which facilitate the working process or increase efficiency.

Indicator 14 - Absenteeism Bradford factor,
Indicator 15 - diversity index.

3. QUALITY ASSESSMENT

Primarily to determine the quality of the KPIs we defined, we have conducted Data Envelopment Analysis (DEA). DEA is a mathematical programming methodology [1], [2], initially developed as methodology for assessing the comparative efficiencies of organizational units [3]. It has been used successfully for determination the relative performance of a set of units, usually called decision-making units (DMU). DEA is a non-parametric method of choosing a benchmark and then measuring efficiency with multiple inputs, multiple outputs, and no market prices (DEA uses linear programming to compute 'weights' or 'shadow prices' as the alternative to them).

The method assumes that there is no random noise, while the data used to represent inputs and outputs are correctly known, and it does not matter how many variables are needed. Also, it is assumed that there is no unique inputs or outputs.

The objective of the DEA is to identify the DMUs that produce the greatest amount of outputs by consuming the least amount of inputs. A DMU is defined as efficient if the ratio of weighted sum of outputs to the weighted sum of inputs is the highest. In our study we defined five DMUs:

- dmu_1 represented SR IM, with data collected for 2017,
- dmu_2 represented Srbija Voz with data collected for 2016,
- dmu_3 represented Srbija Voz with data collected for 2017,
- dmu_4 represented Srbija Cargo with data collected for 2016, and
- dmu_5 represented Srbija Cargo with data collected for 2017.

In the study, we used linear programming model defined as:

$$\text{maximize } \sum_r u_r \cdot y_{rjo} \tag{1}$$

subject to:

$$\sum_i v_i \cdot x_{ijo} = 1 \tag{2}$$

$$\sum_r u_r \cdot y_{rj} - \sum_i v_i \cdot x_{ij} \leq 0 \quad \forall j = 1, \dots, n \tag{3}$$

$$u_r, v_i \geq 0 \quad \forall r, i \tag{4}$$

In order to determine quality of defined KPIs, we have used two different DEA models. Our main goal was to establish quality level of compound key performance indicator “Human Capital Value Added“.

So, firstly we defined simple DEA model with only one input and one output (Table 1):

Input	Output
Salary Competitiveness Ratio	Human Capital Value Added

We obtained results given in Table 2:

DMU	Salary Competitiveness Ratio	HCVA	Efficiency	Relative Efficiency
dmu_1	0.8488	1347.71	1587.721	0.889216
dmu_2	0.6979	1143.28	1638.167	0.917468
dmu_3	0.8374	987.97	1179.848	0.660783
dmu_4	0.8484	1514.91	1785.53	1.000000
dmu_5	0.8511	1160.78	1363.817	0.763816

From Table 2 is obvious that the dmu_4 (Srbija Cargo with data collected for 2016) is the efficient DMU, while all the other values represent efficiency of related DMU relative to dmu_4.

After that, we defined another DEA model, in order to check whether the ordinary inputs and outputs will “select“ the same DMU as the most efficient one. This time, we have used common inputs and one output, shown in Table 3:

Input	Output
Operational Costs	Operational Revenue
Employment Costs	

We have obtained:

DMU	Operational Costs	Employment Costs	Operational Revenue	Relative Efficiency
dmu_1	14359669	8640737	14251288	0.583753
dmu_2	7212558	3022209	6997098	0.889195
dmu_3	6841321	2573267	6426763	0.891620
dmu_4	9616730	4100974	10395275	1.000000
dmu_5	9781397	3134680	9913157	0.944345

We obtained the same DMU as the most efficient one. Although we didn't get the same rank order, we could conclude that KPI "Human Capital Value Added" was properly selected to perform management performance evaluation.

Further, we have conducted the sensitivity analysis, in order to define how much DMU input values should be changed for each DMU, to set that DMU as the most efficient one, but since our goal wasn't to really evaluate company performance management through DEA, but using KPI we defined, we were satisfied with the obtained results.

The same analysis should be conducted for quality assessment of "Absenteeism Bradford factor", as another composite, complex indicator, but it wasn't carried out due to the lack of the data.

4. CONCLUSIONS

As a result of the analysis, the following conclusions have been drawn regarding the achievement of a better Success Management System, which is possible in the implementation of a series of activities:

- Improved awareness and coordination of information at different hierarchical levels through optimization of the communication system;
- Optimizing the system for allocating responsibilities for increasing labor productivity;
- Updating of the system for monitoring, evaluation and compensation of labor;
- Optimization of the training and retraining system for the employees;
- Development of information technologies and decision-making system;

In the planning process, it is appropriate to use a method to ensure continuity of the process, namely: planning, monitoring and reviewing the work of the employees.

Apart from the usual, several complex indicators have been defined. The quality of such indicators was verified using the Data Envelopment Analysis, through two, mutually independent models. As for both models we have obtained the same efficient DMU, we can conclude that selection of the "Human Capital Value Added" as key performance indicator was justified and that indicator can be used to performance management assessment of the companies.

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