# The Decisional Process of Proper Selection of Managers from Railway Transport

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**Abstract**: The current economic context as led to a significant drop of open positions on the workforce market at the same time with the reorganization that many organisations had to accomplish. The consequences haven't stopped appearing in the way in which, today there are many candidates with working experience who have occupied management positions in other companies and are now in search of new jobs. Some organizations have stopped hiring, as it happened in the case of The National Company CFR S.S., and those that still have open positions for recruitment are focusing on skills, multiple competences and proven expertise in a certain field. On the workforce market this thing means that those candidates who have skills and proven expertise are the most demanded ones. The purpose of this paper has been the identification of an adequate methodology of selection regarding railway staff, needed in the main activities of human resources management. The study is based on using the method of global utility and ranking individuals based on the order of skills in order to choose the most suitable manager so that he can take part in a training course organized by the European organism with responsibilities in the field of professional development. The research hypothesis has been as it follows: A proper assessment of human resources in order to choose, following MRU new demands regarding railway transport, causes the growth in efficiency in railway management.

**Keywords:** human resources management; the method of global utility; ranking; regional railway transport

**Jel Classification**: M12; M51

## 1  Introduction

The permanent changes in one organization's environment cause new requirements in job content and demands the development of new competences. Professional training of human resources becomes, in these conditions, a stake and a factor of change, and uninterrupted training represents a requirement through which the value of a modern organization is maximized. Contemporary economic changes have made managers of upper level to move their attention from natural resources to intellectual assets and carefully examine the way in which the knowledge on which the company's activity is based on are exploited. Any organisation has a patrimony of talents, knowledge and experiences which it manages in one way or another. These are traditional organisations, that lose more and more before modern organisations, namely learning organisations. These organisations know how to enlarge the knowledge patrimony and to make sure it has perenniality through training policy and professional improvement. According to a 2010 study of Romanian Manpower Company, although the number of companies which encounter difficulties in covering key positions have significantly reduced in 2011 from 2010 due to changes in offer-request report, skills scarcity is still an important problem for over a third of Romania's employers. The result of the study confirms that not only the numbers of available candidates on the workforce market is important but also the mix and level in their skills.

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The growth of railway infrastructure interoperability and the degree of connection of main railway routes in Europe are current goals of the European Railway Agency, ERA and in order to achieve these aims, there have already been established a series of measures materialized in adopting some of the European Commission's court directives, which our country, through the Ministry of Transport and Infrastructure has transposed into the National legislation. A measure of uniformity among UN countries of practices targeting access control of railway infrastructure for all types of railway vehicles has been adopted by ERA, which organized in Brussels in the second half of 2011 a training course where experience exchanges between railway management specialists from all UN countries took place. At this manifestation Romania has been represented by eight engineers of public railway infrastructure administrator CFR S.S., one for each territorial exploitation center.

## 2   Identifying the Research Problem

In order to establish the suitable people to participate at this course, traffic department inside CN CFR S.A. Bucharest asked each eight Traffic Departments of regional railway branches to identify a manager, specialized in controlling and exploiting railway infrastructure. At the level of Constanta "CREIR CF" Branch which was subject of this study, the identified problem targeted the decision of choosing the most suitable manager, who had to hold the necessary qualities in order to participate at this scientific manifestation. In this respect, the regional manager together with the chief of Traffic Branch have decided to choose the manager from the organizational structure, best placed in terms of managerial and professional performance evaluation in 2010. The "CREIR CF" Constanta Branch located in Number 10, Albastrelelor Street, Constanta is organized into a central structure that co-ordinates the entire activity and local subunits on different fields of activity respectively lines, installations, traffic which are spread in four south-east counties of the country where the regional center has its competence activity: Constanta, Tulcea, Calarasi and Ialomita. The "CREIR CF" Constanta Branch administrates the public railway infrastructure and organizes the circulation of freight and passenger trains on the routes corresponding to eight thoroughfare Bucharest – Constanta. The list of candidates included the managers of some services and departments under Traffic Division, who have responsibilities in organizing, leading and controlling the circulation on railway infrastructure and having a lot of experience in the field. The six chosen managers in order to decide the best option, expert engineers have been: the chief of Infrastructure Access Control Department, the chief of Infrastructure Access Regulation Department, the chief of Traffic Department, the chief of Traffic Control Constanta, the chief of CFR railway station Constanta and the moving sector auditor.

As a stage in our research, the statistic observation has been conditioned by the purpose of this research, by the features of studied object and by the calculation technique used. Depending on these factors the observation has been organized which implies the direct data collection through statistic ways, processing and recording in statistical forms of some data already present in different documents (Neacsu, G. 2009). Considering the way of choosing the most suitable manager, established by the regional manager along with the chief of Traffic Branch, we have initiated "the office research" by collecting and structuring the information found in Traffic Branch reports and records. In this respect, the evaluation forms of professional performance of Traffic Branch employees have been studied, annually completed by the direct hierarchic chief. This form is processed by universally accepted model in specific literature in our country (Pitariu, H. 2006) and applies to all employees no matter the held position. The form contains evaluation criteria, numerically measured and quantified in scores and the value of total score allows performing a hierarchical performance.

From the study and interpretation of the evaluation forms of the activity led by the six managers in 2010, a classification hasn't been possible to accomplish in order to identify the best candidate as two of them had the same final score as it can be seen in Table 1.

**Table 1 Scores obtained by railway managers applicants**

| Applicant | Score |
|---|---|
| Chief of Infrastructure Access Control | 34 |
| Chief of Infrastructure Access Regulation | 34 |
| Chief of Traffic Department | 28 |
| Chief of Traffic Control Constanta | 25 |
| Chief of Railway Station Constanta | 24 |
| Moving sector auditor | 20 |

*Source: Evaluation forms of Traffic Branch managers' performances in 2010*

Where equal scores have been recorded in order to make a tie, the subjectivism intervenes both in the case of the assessor who can bias the candidates, and the assessed also in the case of having a selection decision. Accordingly, this method of choosing a manager, performed only by consulting the annual evaluation of professional performances as it is usually done in the analyzed branch, I have considered inefficient and inconclusive for the identified problem.

In Figure 1 the logic scheme of carrying out the research by using the two well-known methods in specialized literature.
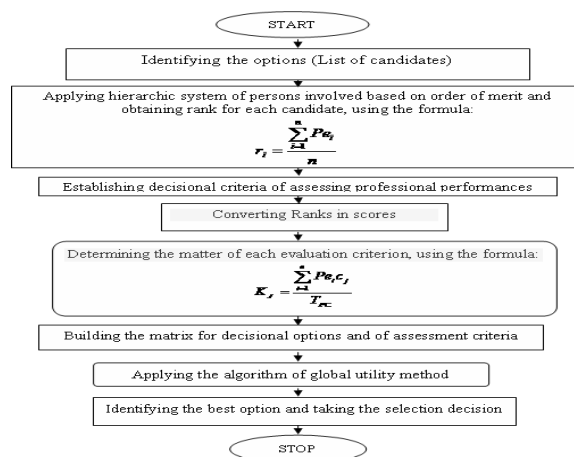


**Figure 1 Model of staging the research**

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As the branch management hasn't before confronted until now with such a demand and considering the necessity of implementing a solid scientific stringency, we appreciate as advisable our position regarding using a proper methodology in order to select managers , this being: *the hierarchic system based on order of merit and the method of global utility in taking this decision.* In order to offer a scientific based and objectively determined solution to the problem we have used the hierarchic system of persons based on order of merit, as method of appreciation of professional performances and the method of global utilities used in order to take the decision of selection in terms of certainty.

## 3  The Methodology regarding the Selection Decision

### 3.1  Hierarchic system based on the order of merit

Also known as "comparing the entire group" (Pitariu, H. 2006), this system consists of writing the names of assessed persons on a note each and then the set is given to the assessor to order them hierarchically according to a certain criterion, from the best individual to the weakest. The remaining

subjects are once more alternatively classified, one by one, through the comparison indicated – not indicated, until the group is used up. The result of applying the assessment system through comparison is a hierarchization in which the best individual receives the first rank, the one that follows the second rank and so on. The ranks are then converted in normalized scalar values or classified in multiple groups of ranking according to a certain criterion.

### 3.2 The Method of Global Utility

Developed by researchers Von Neuman and O. Morgestern in 1947, it is used in optimizing the economic decision in terms of certainty establishing the optimum solution from a multitude of possible options. The utility concept measures the importance that a certain decisional option which belongs to a multitude of options has for the person who has to choose. Processing and adjusting, from specialty literature of the stages in global utility method, has allowed the obtaining of an own calculation algorithm in seven steps (Dăneci-Pătrău, D. 2011) and which is presented in logic scheme in Figure 2.
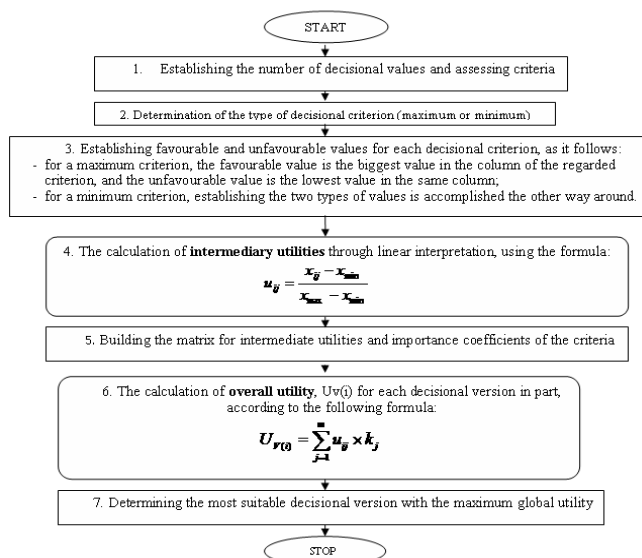


**Figure 2. Algorithm to use the global utility**

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The calculation of intermediate utilities has been achieved through linear interpolation, using the formula:

$$u_{ij} = \frac{x_{ij} - x_{\min}}{x_{\max} - x_{\min}} \tag{3.1}$$

where: uij is the intermediate utility calculated for the version i = 1,……..n and the criterion j=1,…..,m, with the property that 0<uij<1; xij is the value from the matrix of economic consequence in criterion column x max is favorable economic consequence in *j* criterion column[1].

The calculation of global utility, Uv(i), for each decisional option in part has been performed according to the formula:

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[1] The favourable economic consequence of j criterion in consequence matrix is the maximum value from criterion j column, if that criterion is a maximum criterion – business number, profit, cashing – or the minimum value from j criterion column, if it is a minimum criterion – costs, spendings, losses, consumptions.

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$$U_{V(i)} = \sum_{j=1}^{m} u_{ij} \times k_j \tag{3.2}$$

## 4 Presenting the obtained results

Establishing the assessment criteria of candidates has been made using the research of different opinions from specialty literature regarding this topic (Roşca, C. et al. 2005, Manolescu, A. et al. 2004), consulting the information in personnel records of Human Resource Department and of used criteria in assessmenr forms, found in Traffic's Department archives. Synthetizing the obtained information allowed us to establish three assessment criteria of professional performances of managers, as it follows:

- professional knowledge;

- personal skills and competences;

- managerial efficiency.

In order to establish candidates scores required in building the matrix from the global utility method algorithm, the hierarchic system has been used and then a proper score has been given to each rank level obtained. The hierarhization of each candidate according to each criterion has been made by three assessors who know the candidates very well and they are: the regional manager, chief of Traffic Department and chief of Human Resources Department. I have given them a set of six notes with the names of manager candidates and I asked them to rank them correspondingly to each appreciation criterion. According to the ranking system based on order of merit, each candidate was given a rank from one to six for each criterion, rank which has been turned into a score, using the conversation scheme in Table 2.

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**Table 2. Converting scheme in scores for ranks**

| | |
|---|---|
| Rank 1, most important | 100 points |
| Rank 2 | 80 points |
| Rank 3 | 60 points |
| Rank 4 | 40 points |
| Rank 5 | 20 points |
| Rank 6, the most important | 0 points |

The calculation method and the obtained results in ranking candidates considering the three criteria are presented in Table 3.

**Table 3. Candidate scores using ranking method based on order of merit**

| Criteria | Assessors / Applicants | Regional manager E1 | Chief Traffic branch E2 | Chief HR Department E3 | Rank calculation | Rank | Score applicant |
|---|---|---|---|---|---|---|---|
| **First Criterion** *Professional knowledge* | Chief Regulator Circulation | 4 | 4 | 3 | 4+4+3=11:3=3,66 | 4 | 40 |
| | Chief of Department RAI | 3 | 1 | 2 | 3+1+2=6:3=2 | 2 | 80 |
| | Chief of Dep. Circulation | 2 | 3 | 4 | 2+3+4=9:3=3 | 3 | 60 |
| | Station Master | 5 | 6 | 5 | 5+6+5=16:3=5,33 | 5 | 20 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Chief of Department CAI | 1 | 2 | 1 | 1+2+1=4:3=1,33 | 1 | 100 |
| | Moving sector auditor | 6 | 5 | 6 | 6+5+6=17:3=5,66 | 6 | 0 |
| **Second Criterion** *Personal skills and competences* | Chief Regulator Circulation | 5 | 6 | 6 | 5+6+6=17:3=5,66 | 6 | 0 |
| | Chief of Department RAI | 1 | 2 | 3 | 1+2+3=6:3=2 | 2 | 80 |
| | Chief of Dep. Circulation | 3 | 3 | 2 | 3+3+2=8:3=2,66 | 3 | 60 |
| | Station Master | 6 | 4 | 5 | 6+4+5=15:3=5 | 5 | 20 |
| | Chief of Department CAI | 2 | 1 | 1 | 2+1+1=4:3=1,33 | 1 | 100 |
| | Moving sector auditor | 4 | 5 | 4 | 4+5+4=13:3=4,33 | 4 | 40 |
| **Third Criterion** *Managerial efficiency* | Chief Regulator Circulation | 4 | 3 | 6 | 4+3+6=13:3=4,33 | 4 | 40 |
| | Chief of Department RAI | 1 | 1 | 1 | 1+1+1=3:3=1 | 1 | 100 |
| | Chief of Dep. Circulation | 3 | 4 | 2 | 3+4+2=9:3= | 3 | 60 |
| | Station Master | 5 | 5 | 5 | 5+5+5=15:3=5 | 5 | 20 |
| | Chief of Department CAI | 2 | 2 | 3 | 2+2+3=7:3=2,33 | 2 | 80 |
| | Moving sector auditor | 6 | 6 | 5 | 6+6+5=17:3=5,66 | 6 | 0 |

In order to establish the importance coefficient for each criterion, the three assessor manager have been interviewed and were asked to answer questions in the chart presented in Figure 3, then we gathered the answers and calculated the weight of each criterion in total score.

**Figure 3 Form used in the determination of importance factors of assessment criteria**

The importance coefficient for each criterion, Kj has been determined as being the value of each weight value, so that k1=0.35, k2=0.40 and k3=0.25, as a result from the calculations made and presented in Table 4.

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**Table 4 Calculation of importance coefficients of assessment criteria**

| Criteria | First Assessor | Second Assessor | Third Assessor | Total score | Weight Kj |
|---|---|---|---|---|---|
| **First Criterion** | 5 | 4 | 3 | 12 | K1=12/35 = 0,35 |
| **Second Criterion** | 4 | 5 | 5 | 14 | K2=14/35 = 0,4 |
| **Third Criterion** | 2 | 3 | 4 | 9 | K3=9/35 = 0,25 |
| Total | | | | 35 | 1,00 |

Having the candidates scores calculated according to the hierarchy based on the order of merit for each criterion of appreciation and the values of importance coefficients, obtained from questioning the three manager assessors, the next step was building the matrix to which the algorithm of global utility method was applied. This matrix, which has seven lines corresponding to the six decisional versions and a line represented by the importance coefficients of criteria, with three columns corresponding to appreciation criteria is presented in Table 5.

**Table 5 The matrix of decisional versions and assessment criteria**

| Criterii, $C_j$ / Versions Decision, $V_i$ | First Criterion (*maximum*) Professional knowledge | Second Criterion (*maximum*) Personal skills and competences | Third Criterion (*maximum*) Managerial efficiency |
|---|---|---|---|
| Variant 1 Chief Regulator Circulation | 40 | 0 | 40 |
| Variant 2 Chief of Department RAI | 80 | 80 | 100 |
| Variant 3 Chief of Dep. Circulation | 60 | 60 | 60 |
| Variant 4 Station Master | 20 | 20 | 20 |
| Variant 5 Chief of Department CAI | 100 | 100 | 80 |
| Variant 6 Moving sector auditor | 0 | 40 | 0 |
| **The importance coefficient for each criterion, $K_j$** | 0,35 | 0,4 | 0,25 |

All three assessment criteria are maximum criteria as, the more the scores corresponding to these criteria grow, the more the risen level of professional and managerial performance is reflected. Under these conditions, in order to calculate intermediate utilities through linear interpolation according to formula 3.1., the favourable value in the column corresponding to each criterion is the maximum one and the unfavourable one is the minimum. Using the data in the matrix of intermediate utilities in formula 3.2, the calculation of the values for overall utilities corresponding to each decisional value followed. These final values are presented in Table 6.

**Table 6 Overall utility values for each decision option**

| Versions Decision, $V_i$ | Overall Utility $Uv(i)$ |
|---|---|
| Variant 1 Chief Regulator Circulation | 0.24 |
| Variant 2 Chief of Department RAI | 0.85 |
| Variant 3 Chief of Dep. Circulation | 0.60 |
| Variant 4 Station Master | 0.20 |
| Variant 5 Chief of Department CAI | 0.95 |
| Variant 6 Moving sector auditor | 0.16 |

According to the last step of the algorithm of global utility method, the best option has been determined as being the option with maximum global utility. Because U (V5) = 0.95, we have decided

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that the Chief of Access Control Infrastructure Department, being the manager in "CREIR CF" Branch, the most suitable person to participate in the training course organized abroad.

## 5   Conclusions Using Selection Method through Ranking Based on the Order of Merit and of Global Utility Method

The obtained solution through using the system of ranking managers based on the order of merit and of global utility method has been presented to the management of "CREIR CF" Branch, Constanta. As a consequence the decision of naming the chief of Infrastructure Access Control Department has been taken in order to participate at the required training course.

The final validation of the proposed model, we consider it has been accomplished through the fact that at the end of the training course have been examined through practical and theoretical testing all the participants and the chief of IAC Service from "CREIR CF" Branch, Constanta got the best score al all eight Romanian managers, being the fifth in over one hundred and fifty participants. This result sustains the selection decision of the most deserving manager in "CREIR CF" Constanta Branch, decision taken by using the selection model we proposed and checked through well-known methods in specialty literature.

The function of the Human Resources Department inside a railway branch, tends in general, to balance as role between two often encountered extremes namely operational role and strategic role. But the financial crisis that occurs at the moment worldwide and which occurs in Romania also, makes this moment a proper one for the role of human resources departments to raise, thus becoming a strategic partner in solving the problems related to this crisis and also in planning the objectives at organizational level.

The analysis results regarding the management of human resources inside "CREIR CF" Branch, Constanta led us to the appreciation that in a close time horizon, the management of employees' performances will progressively develop and the compensation mechanisms according to performances will gain a strategic importance.

Based on them the organizational structure of the company will be remodeled in order to line up as well as possible the railway needs with available resources. Thus, the compensation scheme and the financial results that are in close connection to the personal profile of each manager will stay at the base of employees performance analysis, becoming the key-indicator for a further development of human resources inside the company.

Organizing inside the Human Resources Department a group of specialists that will implement an objective assessment system of individual performances for each category of employees and to sustain transparency in reward practices we consider that it is natural to stimulate the staff implication in attaining the financial-economic performance objectives of the company and to increase flexibility in awards management.

## 6  Future Research Directions

In order to rise the activities efficiency in the department of Human Resources in "CREIR CF" Branch, Constanta, we appreciate as being extremely useful the implementation of decisional created model, with some specific adjustments in order to optimize forming and training professional activities of all employee categories, both with executive function and leading ones. This course of action becomes essential under the conditions of continual reorganization in the railway transport system, offering assistance to leading managers in taking future decisions of dismissing railway staff.

Developing all research and among private railway operators, which we expect to have a rising weight in the whole system of transport in order to highlight management and human resources activities differences compared to the public system.

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In conclusion, the primary direction of future research will be oriented towards major problems with which the railway transport system is confronted connected to the human resources management activities, problems that need to be solved as soon as possible so that they don't exacerbate.

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