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Investigations of the quality of work in a mining industry

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ABSTRACT

Purpose: The aim of this paper is to present the critical analysis of the problem of quantification the elements that constitute the concept of a quality of work. This process must be divided into two phases. In the first one it is needed to determine the problem of work: its range and criteria. Secondly it is important to investigate the set of quality features that precisely describe the range of the elements that create the concept of a quality of work.
Design/methodology/approach: The research methodology, in presented work, has been based on the theoretical analysis of the quality tools management and on the empirical researches. Mainly the tools of the multi-criteria analysis and multi-variant analysis are applied to solve the main scope of the presented work.
Findings: The proposals of improvement of the quality of work measurement technique have been presented. It has been proposed an integrated approach to the described problem. These results show that it is very important to join theoretical results of methodological researches and practical applications of specific methods.
Research limitations/implications: The area of multi-criteria methods is very wide so the researches have been narrowed to the analysis of the weighted notes of the multi-criteria analysis. Secondly the proposed model has been elaborated for the conditions of work in a mining industry. So next investigation are needed to control its universality.
Practical implications: It has been showed that analysis of the quality of work allows to improve the work organization in the mining industry. The changes, proposed in this paper allow also eliminating some management routines that are conventionally use in the investigated industry. Moreover it broadens the area of application of the method of quality of work estimation.
Originality/value: The presented model and techniques used in the described analysis are the original author solutions.
Keywords: Quality Management

1. Introduction

The concept of the quality of work belong to the broader scope of sociological problem of quality of live. In this sense it is possible to present this problem as being linked with corresponding to him the institution of economy, what is presented in the Fig. 1 [1, 2].

Analyzing the presented diagram it is possible to precisely define the term work which constitute the concept of a quality of work. Firstly one can determine work as a purposefulness human action in the area (institution) of economy. Hence the purpose of this action is related with manufacturing material goods and its utility value that are the fundamental condition of existing and development of the society. Secondly the concept of a quality of work is related with the human economic action what indicates the praxeological perspective of analysis. It allows to analyze the presented problem in the category of its efficiency [3, 4].

The presented model of Quality of Life let us prepare the basic assumptions for proposed model of a quality of work. Secondly the presented model, taking into account the concept of an economic action, is based on the assumption that this action could be understand as an action in an industry plant.

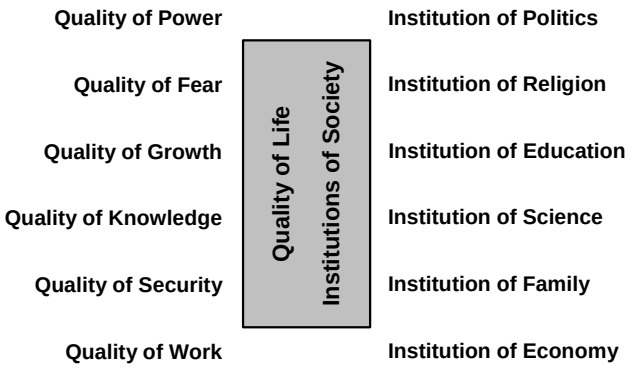

Fig. 1. The structure of the concept of the Quality of Life

2. The model of a quality of work

The problem of determination the quality of work in an industry plant is a very compound task. Firstly it is important to determine the actors of the process of a quality of work determination and improvement (Figure 2).

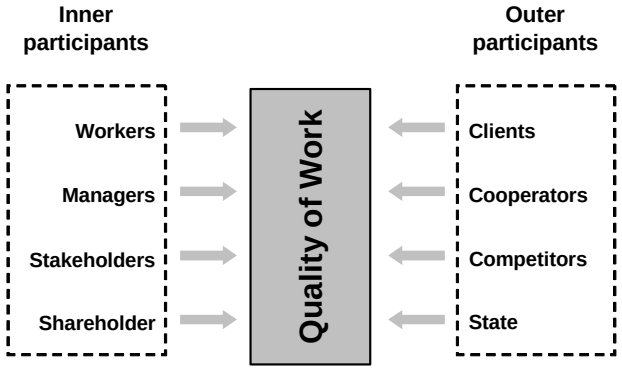

Fig. 2. Participants of the process of quality of work improvement

In the Figure 2 it has been presented two groups of actors of the process of quality of work determination: an inner one and an outer one. The first one consists of the participants which are directly interested in the quality of work. They are the beneficiaries of the process of the quality of work increasing. Moreover the level of a quality of work is linked with theirs total quality of life. The second group of participants is called the outers one. It includes all participants who experience the influence of the level of a quality of work only indirectly. For them the quality of work is reflected as a quality of a product or a quality of an environment.

Taking into account all that groups of interest and factors consider with them the proposed model has been limited to the group of inner participants. This limitations do not affect the results of investigations hence the influence of the outer participants, in the case of a mining industry, is rather more weak. So the proposed model of a quality of work determination is based on factors related to: workers, managers, stakeholders and shareholders. In the investigated case the group of workers should be understand as a group of cal miners. Managers represent the group of productions supervisors. The third group includes all that are related with the production process. The main role in this group play workers unions. Finally the group of shareholders includes the state organs, and particularly: the Ministry of Economy and Higher Mining Agency.

Analyzing all factors considered with presented group of participants one can proposed the model of a quality of work determination as an additive model of two main group of elements (Figure 3). The notes of these two groups, taking into account their weights, product the note of the total quality of work [5, 6].

Weights of particular groups are determined during investigations according to opinions of questioned persons.

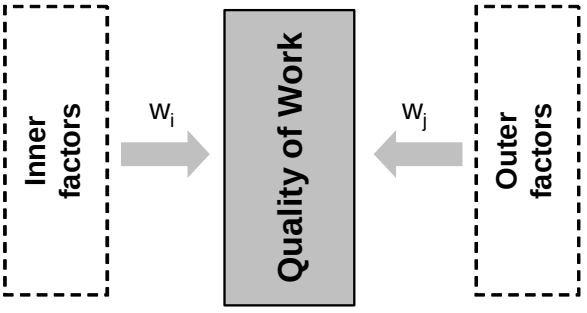

Fig. 3. The general model of a quality of work

The first group of factors is considered with elements that characterize the working people (Figure 4). They are divided in a group of seven elementary factors.

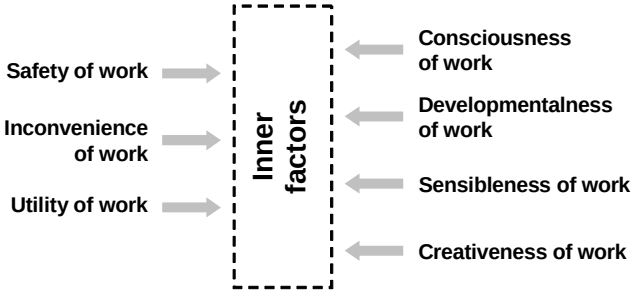

Fig. 4. Inner factors of a quality of work

The first group of factors is considered with elements that characterize the working people. They mainly affect the motivation of a worker as the main factor that influence on the quality of work level. This group consists of two smaller groups. The first includes: safety, inconvenience and utility of work. These parameters shows a subjective estimation of work conditions. The second group includes: consciousness, developmentalness, sensibleness and creativeness of work. These factors represent the level of understanding of work.

Second group of factors (outer one according to Figure 3) is presented in the Figure 5. Also this group consists of seven

elements. These elements could be called as neutral ones in comparison with the inner factors. They could be related with a hygiene as an element of work conditions model.

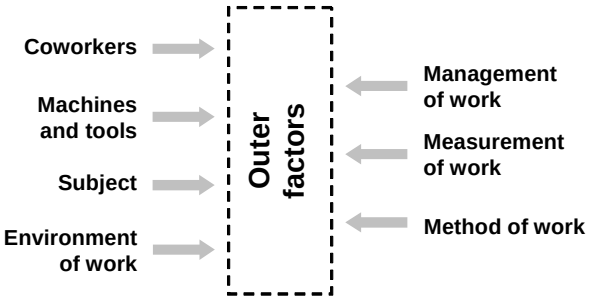

Fig. 5. Outer factors of a quality of work

Outer factors also group into two sub-groups. The first one includes: coworkers, machines and tools subject and environment of work. This factors describes the conditions in a work scene or station. Second sub-group includes: management, measurement, and method of work. These elements represent the managerial or supervisory elements of work.

Basing on presented groups of factors it is possible to determine the note of a quality of work as a result of sub-notes estimated on the base of described elementary factors. In the presented work it has been assumed that all elementary factors have the same weight. This is why the weights are not showed on the Figures 4 and 5.

3. Features of work in a mining industry

Work in a mining industry characterizes with many specific elements. The main production process is related with coal mining in underground pits. So this process is strongly dependent on the geological conditions. So the environment of work affect the subjective feeling of the quality of work level [7].

Fig. 6. Work in a corridor pit

Miners in pits are protected using mechanized or corridor supports, what is presented on Figures 6 and 7. These supports could protect miners against different loads of a coal bed but it is impossible to protect miners against huge dynamic geological phenomena [8]. Miners are also equipped with means of individual protection, particularly masks and absorbers.

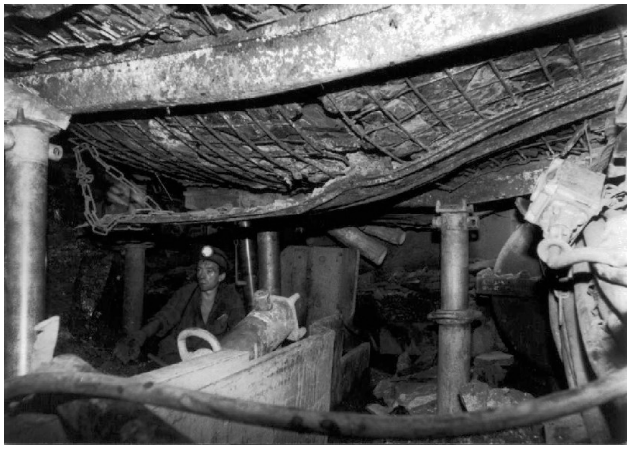

Fig. 7. Work in a wall pit

Experienced mining supervisors also emphasize the importance of knowledge of miners (work experience) and the control system of work conditions [9, 10, 11]. It should be stated also that consciousness of work take a role in this process. The investigations conducted in the mine industry show that the process of work is mainly affected by unconscious and inexperience workers.

4. Investigations of the quality of work in a mining industry

Investigations conducted within the framework of this work base on the questionnaires and interviews with miners and their supervisors. It is important to emphasise that investigations were conducted in some phases. During these phases these have been collected data about: the factors of a quality of work, the weights of the factors and the weights of main groups of factors. These investigations results in determination the note of a quality of work in the mining industry. Below are presented only the results consider with the estimation of a quality of work according to opinions of miners (Figures 8 and 9).

Analyzing the results one can state that main inner factors that affect the quality of work are: safety, utility and consciousness of work. Changes of these factors let us improve the reflection of the subjective quality of work. In the second group the main role plays: environment, method and management. It emphasis the high role of supervisor control for the objective work parameters related with geological conditions.

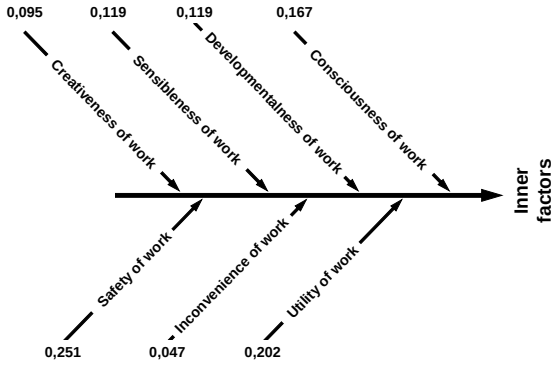

Fig. 8. Notes of inner factors

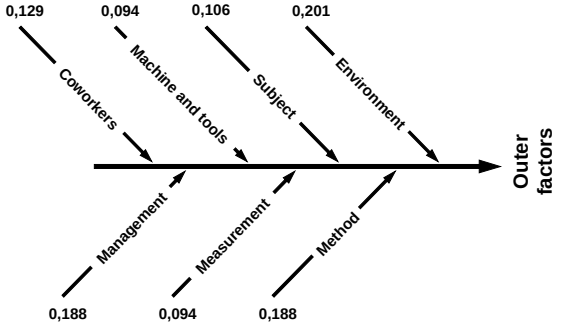

Fig. 9. Notes of outer factors

5. Conclusions

Taking into account the obtained results one must state that this investigations let us point some important factors that influence the quality of work in the industry [12, 13]. Analyzing also the results of investigation considered with determining the weights of main groups of factors it is possible to state that the most important factors of the quality of work in a mining industry are: method of work and management system [14, 15].

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