Investigation of the specifics of the motivation profile in the high-tech enterprises

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Abstract. The report justifies the need to investigate the motivation profile of high-tech enterprises in order to use adequate motivational tactics and techniques in order to have satisfied and committed workers. Different views are given, as well as the author's position on the nature of the motivation profile. Based on own research, conclusions are drawn on the relevance of the motivational factors, the level of satisfaction and commitment from these factors. Specific guidelines and recommendations are given on how to use the motivation potential of the considered factors.

1. Introduction
In today's days, many scientific publications are devoted to motivating workers in enterprises, motivational factors and techniques, a number of successes have been achieved theoretically on mechanisms for increasing work motivation. In-depth studies of the management of the motivation process have been made and its impact on human capital, in line with the European policies for the development of human capital in Bulgaria [1,2]. Shown are the reasons why business practice lags behind scientific methods, methodologies and mechanisms to motivate workers [3].

With the dynamically developing high technology and growing competitiveness of enterprises, motivation issues are of utmost importance for their effective management. High-tech enterprises require highly qualified human resources with specific competencies [4]. In order to make full use of their potential, it is important to know how to motivate the workers most effectively to become satisfied and committed to corporate goals. Company practice has shown that in some cases, notwithstanding management skills for the use of appropriate motivational tactics and techniques, as well as work satisfaction, workers are not very much involved in the labor process. This thesis is the basis of our research – to understand the motivational potential of the factors that will make the workers more engaged in the work tasks in the high-tech enterprises. In this connection, it is a challenge for us to examine the specifics of the motivation profile in high-tech enterprises, as a continuation of a previous study, but with greater scope and enriched methodology, through the prism of satisfaction and commitment to work [5].

2. Basic views of motivational profile
Before we give some insights into the motivation profile, we'd like to look at what high-tech businesses are, what distinguishes them from other businesses. International practice perceives these high-tech industries and services, within which direct costs for scientific, research and development (SRD) are above 8 % of the sales of the relevant sector. According to the Organization for Economic Cooperation and Development (OECD), aerospace, computer and office equipment, radio and television equipment and pharmaceuticals are all in high-tech production. High-tech services are telecommunications, computer and information services, financial services and services related to research and development. As a medium-high technology is assumed the production of research equipment, electrical industry, chemical industry, the production of transport facilities [6]. The peculiarities of high-tech enterprises are related to dynamic changes in technology and products;
significant investment in science, research and development (10 times more than in low-tech, as a percentage of sales revenue); global competition in production, financing and consumption [7]. Logically, the specificity described leads to the need for specific competences of human capital, some of which are: ability to work in an interdisciplinary environment, ability to develop a network, capacity to analyze and understand complex IT tools, organizational culture and managerial skills [4]. All this also determines the specificity of the motivation profile of the employees in the high-tech enterprises. After explaining the specifics of the surveyed enterprises, we will also look at the nature of the motivational profile.

The review of the scientific literature enables us to get acquainted with a number of definitions of the nature of the motivational profile, some of which we have mentioned in a previous publication [5]. Some authors define it as “a complete, comprehensive image of the level of staff satisfaction (or workers in the group) according to the impact of the main motivational factors”, and others as "an analytical image of the extent to which the company meets the different needs of its employees" [8,9].

We are supporters of Tsvetan Davidkov's technology in building the motivational profile, which implies two lines of assessment of the factors of the work situation: by degree of importance and by level of satisfaction. As a rule, for each factor of labor motivation the two grades are compared and this comparison is the basis for description, explanation, prediction of the motivational situation [10]. Our contribution to this methodology is expressed in the assessment and the level of commitment, since it is precisely engaged workers that are needed by high-tech enterprises. After pointing out some views about the motivation profile and our position will you familiarize yourself with the methodology and the results of the study.

3 Methodology and results of the study

3.1 Methodology of the study

The study was conducted in eighty seven high-tech enterprises in Bulgaria between February 2018 and February 2019. Of these, twenty-two are large enterprises, and sixty-five are small and medium-sized enterprises (SME). Twenty-six enterprises have foreign management (Germany, France, Austria, Sweden, Denmark, Italy, Belgium and others.) Participants in the survey are 4350 workers, elected on the principle of education and training. 50% of them (2175) have higher engineering education, as majors that prevail are „Mechanical engineering and technology”, „Mechanical engineering and instrumentation”, „Transport equipment and technologies”, „Electrical engineering”, и „Electronics”. We categorically designate these participants in the Group A study. The other half have secondary vocational education in the fields „Technical sciences, manufacturing and construction” and „Information and communication technologies”. These are Group B participants. The method is borrowed from Tsvetan Davidkov, being supplemented and enriched with determination of the degree and commitment in the participants' labor process [10].

The study covers six stages: develop surveys; conduct the poll; ranging the motivational factors; determining the degree of satisfaction; determining the degree of engagement; an indication of the motivation potential of each factor. The survey maps the questions related to the assessment of the significance of 15 motivational factors, with an evaluation scale of 1 to 7 as follows: 1 – most significant; 2 – significant to a great extent; 3 - moderately significant; 4 – significant to a lesser extent; 5- rather insignificant; 6 – insignificant; 7 – absolutely insignificant. The choice of motivational factors is the result of previous research experience of the authors and from preferences demanded by high-tech enterprises. Participants evaluate the extent to which each motivational factor is important for their better performance, as against each motivation factor they mark the corresponding rank in the range from 1 to 7. Similarly, the satisfaction and commitment to work is examined by each factor. As a result, the average value of the indicator is calculated and factoring is performed. The study is conducted for Group A and Group B participants. The main idea is to compare the importance of motivational factors with their actual state, measured by the satisfaction
and commitment of the participants in the survey. The logic on which the thesis is based is that the strong significance of the motivation factor and the low level of satisfaction with the factor, as well as the low level of commitment are a sign of a factor with high motivation potential. Accordingly, the antithesis can be formulated as follows: the low significance of the factor and a high level of satisfaction and commitment to the motivation factor imply its insufficient motivational potential.

3.2 Results of the study
As a result of the survey we received the following results for Group A participants (Table 1)

| Motivation factor                  | Average value of significance (avg.) | Rank 1 | Satisfied (avg.) | Rank 2 satisfaction | engagement (avg.) | Rank 3 engagement | Differe nce (Rank 1-Rank 2-Rank 3) |
|------------------------------------|--------------------------------------|--------|-----------------|---------------------|-------------------|-------------------|----------------------|
| Workplace Security                 | 3,26                                 | 11     | 1,86            | 1                   | 1,88              | 1                 | 10/10                |
| Conditions and safety at work      | 3,42                                 | 12     | 2,28            | 2                   | 2,65              | 2                 | 10/10                |
| Organization of working hours     | 4,86                                 | 15     | 2,36            | 3                   | 3,86              | 6                 | 12/9                 |
| Organization of Work              | 2,92                                 | 10     | 2,48            | 4                   | 3,64              | 5                 | 6/5                  |
| Remuneration                      | 1,52                                 | 5      | 4,62            | 11                  | 4,80              | 11                | -6/-6                |
| Benefits                           | 1,58                                 | 6      | 4,28            | 10                  | 4,42              | 8                 | -4/-2                |
| Teamwork                           | 3,58                                 | 13     | 2,86            | 5                   | 2,80              | 3                 | 8/10                 |
| Communication with colleagues and supervisors | 2,85 | 9 | 3,16 | 6 | 3,88 | 7 | 3/2 |
| Self-sufficiency of work           | 4,26                                 | 14     | 3,26            | 7                   | 4,48              | 9                 | 7/5                  |
| Personal responsibility            | 2,68                                 | 8      | 3,84            | 9                   | 3,62              | 4                 | -1/4                 |
| Recognition of personal Abilities  | 2,42                                 | 7      | 3,66            | 8                   | 5,22              | 13                | -1/-6                |
| Interesting and Challenging Tasks  | 1,32                                 | 2      | 5,42            | 13                  | 5,86              | 15                | -11/-13              |
| Opportunity for initiative and expression | 1,38 | 3 | 5,68 | 14 | 4,82 | 12 | -11/-9 |
| Ability to upgrade the qualification | 1,46 | 4 | 4,86 | 12 | 4,66 | 10 | -8/-6 |
| Opportunity for development and self-realization | 1,26 | 1 | 5,90 | 15 | 5,64 | 14 | -14/-13 |

Ranking in a column titled Rank 1 is based on the degree of importance of motivational factors for the participants in the survey. Estimates close to 1.00 indicate the high degree of relevance of the respondent factor, those that are close to 7 indicate the low significance of the relevant motivation factor. Ranking in the Rank 2 column results from the stated level of satisfaction with the specific motivation factors for the respondents, and in Rank 3 is the ranking based on the engagement of participants in the work process. Estimates close to 1.00 show a high level of satisfaction and commitment, and close to 7.00 - a low level of satisfaction and commitment. The last column of the table is the difference between the ranges of significance of the factors and the ranks of satisfaction.
and commitment (rank significance – rank satisfaction / rank engagement). According to the logic of the research procedure, motivational factors with a negative difference with a higher absolute value, have significant motivational potential.

In the same way, the results for Group B were also obtained.

3.3 Conclusions from the study

By analyzing the results obtained in the table, we can draw the following conclusions for Group A participants - highly qualified specialists with higher engineering education:

1. The first five most significant motivational factors are „Opportunity for development and self-realization ”, „Interesting and challenging tasks ”, „Opportunity for initiative and expression ”, „Ability to upgrade the qualification ” and „Labor remuneration ”.
2. The lowest level of satisfaction, the participants get from „Opportunity for development and self-realization ”, „Opportunity for initiative and expression ”, „Interesting and challenging tasks ”, „Ability to upgrade the qualification ” and „Labor remuneration ”.
3. The lowest level of engagement creates „Interesting and challenging tasks ”, „Opportunity for development and self-realization ”,” „Opportunity for initiative and expression ” and „Labor remuneration ”.

The conclusions that we can make after analyzing the results for Group B participants – workers with secondary education are as follows:

1. The first five most significant motivational factors are „Ability to upgrade the qualification ”, „Labor remuneration ”, „Organization of working hours ”, „Communication with colleagues and supervisors ”.
2. The lowest level of satisfaction, participants get from „Recognition of personal abilities ”, „Labor remuneration ”, „Benefits ”, „Ability to upgrade the qualification ”, „Organization of working hours ”.
3. The lowest level of engagement, the participants get from „Labor remuneration ”, „Benefits ”, „Recognition of personal abilities ”, „Ability to upgrade the qualification ”, „Communication with colleagues and supervisors ”.

3.4 Recommendations

The analysis of the results obtained in the last column of the table gives us the opportunity to highlight the factors with the greatest motivational potential for the two groups of participants. For Group A are the following: „Opportunity for development and self-realization ”, „Opportunity for initiative and expression ”, „Interesting and challenging tasks ”, „Ability to upgrade the qualification ” and „Labor remuneration ”. For Group B – are the following: „Labor remuneration ”, „Benefits ”, „Recognition of personal abilities ”, „Ability to upgrade the qualification ”, „Communication with colleagues and supervisors ”. It is noticeable that the differences between the factors that satisfy and engage the surveyed are small.

What is the practical result of the fact that on the basis of the survey we have identified the factors with great motivational potential? Based on these factors, management of high-tech enterprises can design motivational policies, programs, tactics, techniques, approaches, actions and more. That is what our recommendation is – all motivational actions should be tailored to an in-depth study of the specifics of the motivation profile of workers, through the prism of their satisfaction and commitment to the work process.

4 Conclusion

In the report, we attempted to look at the specifics of high-tech enterprises and, on this basis, to draw the need for a specific approach to building the motivation system in these enterprises. For this purpose, we used the motivational profile as a tool. Based on a study of the significance of motivational factors, the degree of satisfaction and engagement of workers in high-tech enterprises, we have been able to draw conclusions about the motivation potential of the factors. Thus, we can
recommend HR managers, to periodically examine the motivation potential of the factors, which they use in order to have engaged employees and which is more important to be able to keep them in this dynamically changing business environment.

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