GENERAL QUOTIENT OF THE PERSONNEL EVALUATION AND ITS IMPLEMENTATION IN THE PRACTICAL WORKING PROCESS

P. P. VOROBIYENKO[*], E. S. Ozarko[**]

Abstract. *General quotient of personnel evaluation notion is introduced in this paper. This is a vector. The use of the vector was suggested to use for the salary estimation and calculation as well as to encourage an employee to advance his/her professional level. Some information related to the software platform "STIMULUS" ("MOTIVATION"), which is used to make calculations as for the implementation of the human potential technology development, was given.*

Keywords: *personnel evaluation, salary estimation and calculation, motivation.*

1. Introduction

The crucial role of personnel in the development tasks solving has been known since old times. The attention to the staff recruitment has not weakened, but strengthened over the years. The Internet is simply filled up with the classifieds about seminars on human recourses management and education.

But there are a lot of problems in this widest area of human activity. That is why in my report I would like to suggest several conceptual approaches to the problem of human capital assets development seen by an employer. Let us follow the following chain of thoughts.

The employer needs to use human recourses maximum effectively. Then we have to determine general conditions, under which the personnel work maximum effectiveness can be reached. Assuming the most common thoughts we can come to a conclusion that **the harmonization of the working conditions in the widest sense of the word together with the**

[*] Odessa National Academy of Telecommunications, Ukraine, vorobiyenko-@onat.edu.ua,

[**] Odessa National Academy of Telecommunications, Ukraine.

chances of promotion is one of the main terms of the personnel maximum effective working process.

2. Experimental

To be short, the harmonization of a personality and his or her working place should be reached. So, at one side we have to study human personality and at the other one – the working conditions at each working place.

Various testing takes an important place in the general system of the personnel study and recruitment. Here the problem of interpretation and adequate use of the testing results still remains unsolved. In [1], two tables are given based on the distribution of sets of tests into subsets by certain criteria. The first one is the table that describes an ideal employee suitable for a certain working position. The second one pictures a certain employee or candidate for a vacant position. The tables are presented in the form of figures with a certain number of a set of points that characterize a real and an ideal employee. The difference of characteristics of a real employee from ideal demands is calculated with their help. This combination of testing results can be called differentiated. But the integrated presentation of testing results based on tests sets as an integrated evaluation of real and ideal employees which is done with the help of a vector in n-dimensional environment is of an interest.

Because the vector relies on the testing based on the tests sets we will call its length general quotient (*GQ*), and the vector itself – *GQ*-vector.

The aim of this paper is the development of the integrated method of testing results presentation and its practical implementation.

Let us examine the tests results presentation in a three-dimensional environment.

We will use three kinds of tests that evaluate:

1. knowledge;
2. skills;
3. psychology.

Let us normalize the received results by dividing the test result in each test by its maximum value. Such testing results will be within the interval (0..1). An ideal employee is evaluated by all tests that equal 1. Let us suppose that the testing results will be marked on the axes in a three-dimensional environment: knowledge on the *X* axis (we mark this axis by letter "*K*"), skills – on the axis *Y*, which is marked by letter "*S*" and psychology – on the axis *Z* (marked by letter "*P*").

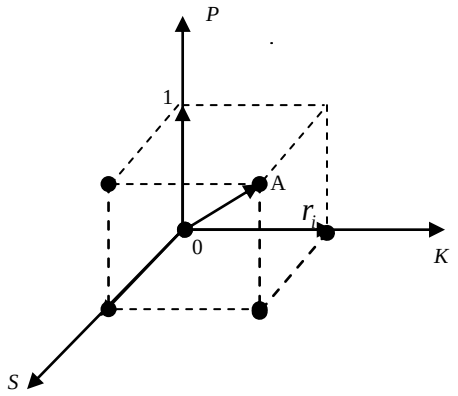

Figure 1.

We accept the testing results as coordinates of *GQ*-vector, which is $\vec{r}(k, s, p) = \vec{r}_1(1,1,1)$ for an ideal employee.

The length of this vector will equal

$$r_i = \sqrt{1^2 + 1^2} + 1^2 = \sqrt{3}.$$

GQ testing data for a real employee will be less than or equal 1:

$$0 \le k_1 \le 1,\ 0 \le s_1 \le 1,\ 0 \le p_1 \le 1.$$

The length of the evaluating vector of a real employee equals

$$r_r = \sqrt{k_1^2 + s_1^2} + p_1^2.$$

It is clear that $r_r \le \sqrt{3}$. We will call vectors $\vec{r}_i$ and $\vec{r}_y$ *GQ*-vectors.

The normative vector length will be called the general quotient which coordinates are normative testing results.

Let us give two examples of the suggested *GQ*-testing integrated evaluation use.

1. Let us find the length of the vector $\Delta\vec{r}$, as a subtraction module $\vec{r}_i - \vec{r}_y = \Delta\vec{r}$. Using coordinates, this vector module is calculated by formula:

$$\Delta\vec{r} = \sqrt{(1-k_i)^2} + (1-s_i)^2 + 1 - p_i)^2.$$

If $\Delta r \le \Delta r_3$, $\Delta r_3 -$ is the permitted deviation of an ideal *GQ*-vector from real one, determined by an employer, then the employee can receive the job.

2. We will use letter *S* for a nominal salary of an employee at a certain working place. Then the ratio s / r_i determines the hired labour rate for an ideal *GQ*-vector unity element.

If a real *GQ*-vector has $\vec{r}_y$ length, then the employee may be offered reasonable salary

$$S_p = r_r \times \frac{\vec{S}}{r_i} = \frac{r_y \times S}{\sqrt{3}}. \quad (1)$$

Such an approach to the salary rate determination creates clear conditions for an employee and shows him true ways of his salary increase during the following repeated testing.

Each employer usually has its own motivation system, where result of Δr decreasing in the process of work and salary increase by formula (1) can be included.

The analyzed methods of the *GQ*-vector definition are easy to extend to any number of various tests. Definitely, let $M = \{x_1, x_2, \ldots, x_n\}$ be a set that is composed of *n*-tests. The vector $\vec{r}$ will have the coordinates $(x_1, x_2, ...x_n)$. The length of an ideal *GQ*-vector will equal $r_r = \sqrt{n}$. The length of a real *GQ*-vector $\vec{r}_y$ will be calculated as

$$r_y = \sqrt{x_1^2 + x_2^2 + ... + x_n^2},$$

And the module $\Delta\vec{r}$ – by formula

$$\Delta r = \sqrt{(1-x_1)^2} + (1-x_2)^2 + ... + (1-x_n)^2.$$

Real salary is calculated by formula

$$S_p = r_r \times \frac{\vec{S}}{r_i} = \frac{r_r \times S}{\sqrt{n}}.$$

The most difficult among various kinds of tests (as for validity and work done concerning the results analysis) is a psychological testing. But, nevertheless, the seeking socio-psychological condition of the personnel allows attracting employees to reach the strategic aims of an enterprise, which is one of the main factors that guarantee successful future development in a dynamic market environment. Psychological skills just harden and put professional skills into action.

The task to increase the testing results reliability was set to solve this problem. It should have been done by finding mutual relation and discovering correlation links among criteria that give characteristics to an employee in various psychological testing systems. In this case the expenses for the results processing should be lowered. As a result of the work the software platform “Stimulus” (“Motivation”) has been created. It

combines two methods (DISC-Dominance, Influence, Steadiness, Compliance and MBTI-Myers-Briggs Type Indicator), that does the following:

– effective staff recruitment organization and its precise positioning within the enterprise

– bringing to light employees' personal traits and business abilities that influence the reach of the targets set by an enterprise

– understanding all the phenomena, talents, abilities, points of reference for the development and obtaining the possibilities to use them fully

– determining the level of an employee's potential abilities to predict his chances of promotion, forming labour reserves

– correcting problems of the employees' behaviour

– recollecting like-minded people

– increasing the effectiveness of corporate programs for the personnel education and development

– creating of a well-thought strategy of a working process

– well-timed crisis-like processes identification and prevention

– motivations, forms and the level of encouragement transformation

– extra-income receiving by using staff potential effectively.

The software platform "Stimulus" ("Motivation") is an interface for the questioning. It processes the results of the questioning, gives a visual presentation of the data processed in a form of a coloured diagrams and generates personal and group reports – diagnoses the human potential.

Two "windows" are given below as an example. Figure 2 shows the results of the system work as for choosing a professional type of activity for a certain employee, and figure 3 presents the results of mutual relations examined in a group.

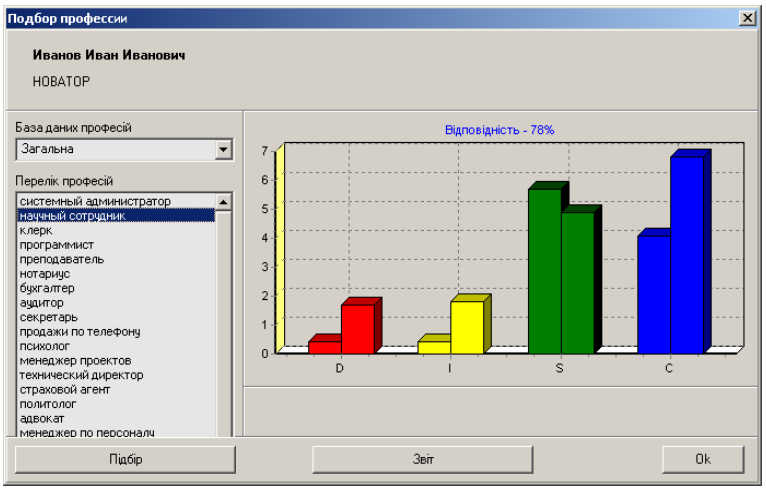

Figure 2.

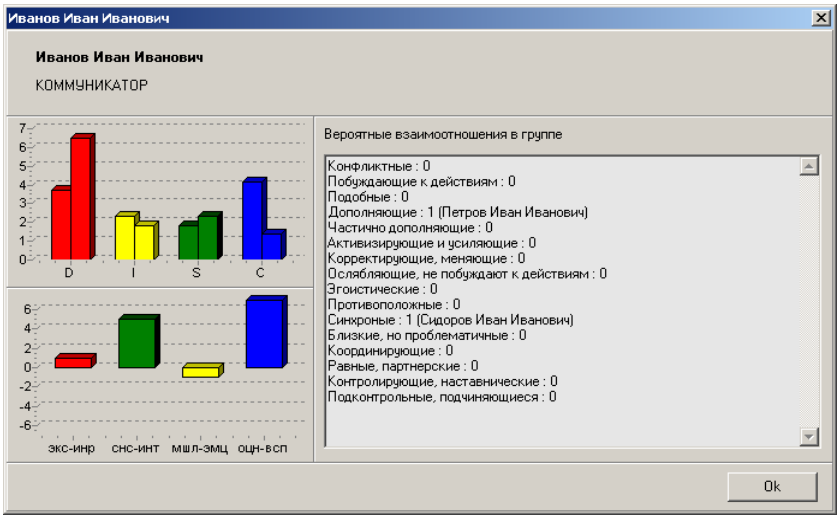

Figure 3.

3. Conclusions

1. This paper suggests the method of an employee's integrated evaluation. The notion of the *GQ*-vector was introduced for this purpose.

2. The method of *GQ*-vector use was suggested to solve the problem of an employment, salary giving and an employee's motivation to improve qualifications as well.

3. The software platform "Stimulus" ("Motivation") has been created. It is regarded as an instrument for human potential development.

REFERENCES

[1] Vorobiyenko P. P., *Human potential development: testing for employment and career advancement*. Research papers of ONAT named after O. S. Popov. 2008, No. **1,** pp. 90-92.

[2] Dr. Russell J. Watson, Wheaton College, *Statistical Comparison between the TTI Style Analysis and the Performax Personal Profile System*, 1989.

[3] Sylvan J. Kaplan, *A Study of the Validity of the Personal Profile System. Minneapolis, MN: Performax Systems*, International 1983.