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The personnel usefulness function – the method for planning and selection of personnel in SME[1]

1. Introduction

Management of potential social organizations, particularly in the SME sector enterprises, requiring the definition of the elements and tools for implementing the personnel function. Personnel function in the company covers all matters relating to people in the organization - including their acquisition, management, professional development. Regulatory activities under this function (ie, planning, organizing, motivating, and controlling) is proposed to be referred to as personnel management (Lichtarski 2000, p. 238).

The role of the personnel function has evolved from operational to strategic. This role was to: (1) Operational - the administration of payroll in the company (years 1900-1945), (2) managerial (tactical) - to bear the responsibility for administration and recruitment, maintenance of relationships with the labor market (years 1945-1980), (3) strategy - including the formulation of HR strategy (since 1980), (Król, Ludwiczyński 2007, p. 47). Currently, it is noted the continuing development of the personnel function, which is required for reasons such as to: increased international competition, the size and complexity of modern enterprises, higher level of education of the workforce, replacing the demographics of the workforce (increasing participation of women and ethnic minorities in the structure of the workforce).

Nowadays, enterprises perceive knowledge as a strategic resource which contributes to the competitive dominance of an enterprise. Small and medium-sized enterprises (SMEs) play a critical role in creating work places and, in a more general sense, they also constitute factors in social stability and economic development. However, given the limited guarantees they can offer: SMEs often encounter difficulties in obtaining capital or credit, as well as the fact that they typically have limited access to information concerning new technologies and potential markets.

Currently, SMEs perceive the employees as strategic resources that contribute to competitive advantage. Therefore sought methods of planning and selection of staff, whose use may lead to an effective and useful management.

The purpose of this paper is to present the author's method for planning and selection of personnel in SME (the personnel usefulness function) and demonstrate the merits of its application in SME.

The article presents the known from literature methods and models of employment planning and selection and then the planning process staff is defined (see chapter 2). In the third chapter an original personnel usefulness function is formulated - a method that allows the planning and selection of personnel in enterprises of the SME sector. Then the implementation of the method developed in the form computer tool Sknowinnov (see chapter 4) is presented. The summary shows the directions of further work.

2. Methods and models of employment planning and selection

Employment plan in enterprises should show the demand for labor organizations in the planning period in terms of qualitative and quantitative criteria for evaluating employees and the manner and

form motivate people to work. Selection and suitability of employment planning methods depends on several key factors: the purpose of which is intended to apply the chosen method of planning, the planning horizon, sources of information that you can use the planning process, the cost of the application of the method. In the literature you can find different methods of planning divisions of employment, including: (1) analytical and descriptive methods, and (2) statistical methods. The first group includes:

1. Managerial Assessment - a method of forecasting the demand for human resources (Armstrong 2001, p. 285). It is assumed that managers know the best of your personal needs. Data collected from the managers are subject to gradual aggregation. This method can be realized "from top to bottom" - the employment forecasts prepared by top management and then agreed upon and presented to the lower-level managers, or "bottom up" - the lowest level managers are preparing information on the demand for staff in their cells organizational forwarded to top management.
2. Delphi method - is to set up a group of experts who draw up opinions on the demand or supply of human resources (King, Ludwiczyński 2007, p. 180).
3. Benchmarking method - is to determine the demand for workers on the basis of information about employment in the best companies of similar profile (Ramos-Rodriguez, Ruiz-Navarro 2004).
4. Forecasting the zero-based - as a starting point shall be the current state of employment, but every year the state of the base is controlled and updated. If there is demand for employment of an employee, it is checked whether it is justified (Kostera 2000, p. 47).
5. Indicator Method - assumed percentages (numbers), the participation of individual professional groups within the company to total employment (McKenna, Beech 1997, p. 102).
6. The method proposed by labor standards: time, performance, handling and stocking. Depending on the solutions contained in the system and the standardization of work, you can calculate the necessary employment in the company (Pawlak 2003, p. 131).

The second group includes:

1. Statistical analysis - using the data from the past and treated them as input to the forecast. Prognostic variables are those factors that have in the past, the impact on employment, such as sales volume, productivity, productivity (Gajek, Kałuszka 2000).
2. Markov analysis - historical trends are treated as base from which to formulate proposals for future (Szałkowski 2002, pp. 27-40).
3. Scenario Forecasting - creative planning, where he is preparing several scenarios of events (Sekuła 2001, p. 134)
4. The method of computer simulation - experiment possible and probable situation (Szałkowski 2002, pp. 27-40).

Skilful use of different instruments in shaping employment in the organization requires management and the HR professionals respective spheres of competence.

Employee selection process is all activities aimed at ensuring competent employees whose work should contribute to the mission and goals of the organization (Pawlak 2003, p. 137). Distinguished the following methods of employee selection: (1) internal recruitment: advertisements in the intranet, the reserve personnel, list of success stories, contests, closed, (2) external recruitment: advertisements in the press, internet, radio, television, the recommendations of employees, employment agencies, universities, (3) selection: analysis of documents, interviews, tests, assessment center, unconventional methods - such as astrology, (4) adaptation: preliminary evaluation of the employee.

The author has attempted to develop a method of forecasting and selection of personnel in the SME sector. It is the method that contains the items listed benchmarking methods and methods based on statistical analysis and Markov analysis, as well as elements of employee selection methods: tests. Personnel usefulness function - a proprietary method for planning and selection of personnel allows us to evaluate the candidate according to accepted criteria of exploration and with the strategic

objectives of the company. The process of planning and selection of personnel using the proposed method consists of the following steps:

- Stage 1: Data collection

  The author conducted a survey in 10 enterprises of the SME sector with a similar profile of activity, consistent with the established and accepted reference model of the SME sector enterprises (Patalas-Maliszewska 2010, p. 21-28), which established the value of personnel usefulness function (see chapter 3) for employees in the following positions in sales area:

  m_1 - Sales Director

  m_2 - Sales Specialist

  m_3 - Marketing Specialist

  m_4 – Regional Assistant

  m_5 - Product Manager

- Stage 2: Determination of potential management objectives on the basis of the social objectives of the organization.

  It is defined the following objective: to gain a new employee with a satisfactory level of the value of personnel usefulness function for a given workplace.

  The author has determined, based on survey results, average values of the personnel usefulness function (see chapter 3) for defined workplaces in the SME sector enterprises:

  for m_1 - Sales Director   - the average values of personnel usefulness function: W = 18,9 pkt. (max.: 35 pkt)

  m_2 - Sales Specialist - the average values of personnel usefulness function: W = 13,2 pkt. (max.: 35 pkt)

  m_3 - Marketing Specialist - the average values of personnel usefulness function: W = 13,9 pkt. (max.: 35 pkt)

  m_4 – Regional Assistant - the average values of personnel usefulness function: W = 15,1 pkt. (max.: 35 pkt)

  m_5 - Product Manager - the average values of personnel usefulness function: W = 17,9 pkt. (max.: 35 pkt)

  The obtained values of personnel usefulness function for each defined workplace allow the measurement of a formulated purpose.

- Stage 3: Decide on employment new employee/es

  Top management an SME uses the personnel usefulness function and using the computer tool (see chapter 4) decides the selection of a worker to the job.

- Satge 4: Monitoring and evaluation of the employment plan

  Top management estimates: actual productivity and efficiency of a new employee, the employment and working conditions in relation to the adopted budget.

In the next section of this article will be thoroughly characterized the method for planning and selection of personnel in SME – the personnel usefulness function.

3. The personnel usefulness function – author's method for planning and selection of personnel in SME

So, let me define the method for planning and selection of personnel in SME - the personnel SME usefulness function W_{nm} for the m-th employee in the n-th functional area in the SME:

$W_{nm} = f(GK, PK, A, E, P, C, R)$, where $n, m \in N$ and:

- GK - General knowledge of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of general knowledge.

- PK - Professional knowledge of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of professional knowledge.
- A - Professional abilities of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of professional abilities.
- E - Experience of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of experience.
- P - Patents of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of patents.
- C - Clients of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level of clients.
- P - Personality of the m-th employee. The value of this parameter is received as the result of tests for employee, which was evaluated within the range from 1 to 5, where 1 is a bad and 5 is a very good level.

So, the following personnel SME usefulness function W_{nm} for the m-th employee in the SME is proposed:

$$W_{nm} = f_1(GK) + f_2(PK) + f_3(A) + f_4(E) + f_5(P) + f_6(C) + f_7(R),$$

where: $n, m \in N$,

The linear form of this function W_{nm} is chosen because all elements are independent and equally important to assess the effectiveness and efficiency of investment in knowledge:
- $f_1(GK)$ – the general knowledge function for the m-th employee in SME, where: $GK \in R$, and $1 \leq f_1(GK) \leq 5$,
- $f_2(PK)$ – the professional knowledge function for the m-th employee in SME, where: $PK \in R$, and $1 \leq f_2(PK) \leq 5$,
- $f_3(A)$ – the professional abilities function for the m-th employee in SME, where: $A \in R$, and $1 \leq f_3(A) \leq 5$,
- $f_4(E)$ – the experience function for the m-th employee in SME, where: E – is a synthetic index of experience for the m-th employee in SME binding the factors ei:
  E = **Błąd! Nie można odnaleźć źródła odwołania.** where: e1- year of work, e2- age of employee, e3- number of realized project. Each indicator $f_4(E)$ is assessed on the points scale (1 – 5) and $1 \leq f_4(E) \leq 5$,
- $f_5(P)$ – the patents function for the m-th employee in SME, where: P - synthetic index of patents for the m-th employee binding the factors pi: P = **Błąd! Nie można odnaleźć źródła odwołania.** where p1- number of patents, p2 - value of investment of new patents, p3 – value of copyright, p4- number of project, which are waiting for patents. Each indicator $f_5(P)$ is assessed on the points scale (1 – 5) and $1 \leq f_5(P) \leq 5$,
- $f_6(C)$ – the clients function for the m-th employee in SME, where: C - synthetic index of clients for the m-th employee binding the factors ci: C = **Błąd! Nie można odnaleźć źródła odwołania.** where: c1- number of all clients, c2 - number of permanent clients, c3– number of transactions. Each indicator $f_6(C)$ is assessed on the points scale (1 – 5) and $1 \leq f_6(C) \leq 5$,
- $f_7(R)$ – the m-th employee's personality in SME, where: $P \in R$, and $1 \leq f_7(P) \leq 5$.

It is possible to receive indispensable data for account of value personnel usefulness function from companies belonged to reference model of SMEs by interview in each enterprise. This model fit the business processes at the workplace, and thus to measure the value of personnel usefulness function of the processes that the employee performs. Each employee should complete the questionnaire. On the basis of an algorithm for testing solutions for each employee it is possible to receive a specific value of the personnel usefulness function and each of the parameters of this function.

It should be noted that the proposed approach to measure the personnel usefulness function allows the measurement of estimated value of the knowledge workers of a company from the SME sector. The value of personnel usefulness function may be used as complement of traditional valuation of a company, which is usually based on the value of tangible assets.). Still the problem remains unsolved: it is not possible to assign individual workers of future revenue streams of the organization, because they arise as a result of human interaction to work with asset.

4. Software tool for planning purposes of employment – Sknowinnov system

To verify the practical usefulness of the method for planning and selection of personnel in SME developed its computer implementation, which allowed for a series of tests that verify its usefulness. Such an implementation is the software system for facilitating decision making at a strategic level in terms of the profitability of investment in staff knowledge - SknowInnov system.

When you start SknowInnov system displayed on the screen is the window title, where position [Add] allows you to add a new company. It allows to verify whether it is possible to carry out the forecast efficiency of the employee selection in this enterprise. Application is appropriate only for companies belong to the reference SME model.
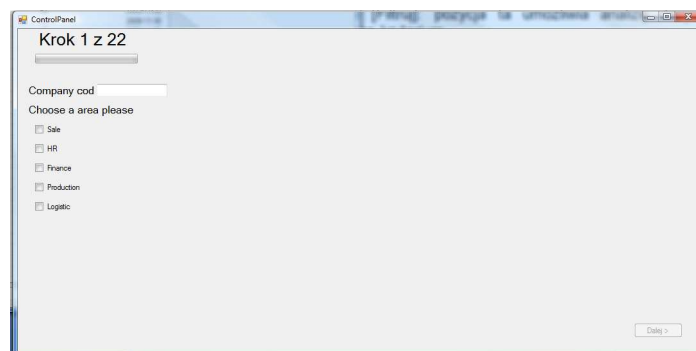

Figure 1. Sknowinnov system
Source: own elaboration

The software user has the option to select the area the company where he works (see Example: figure 2).
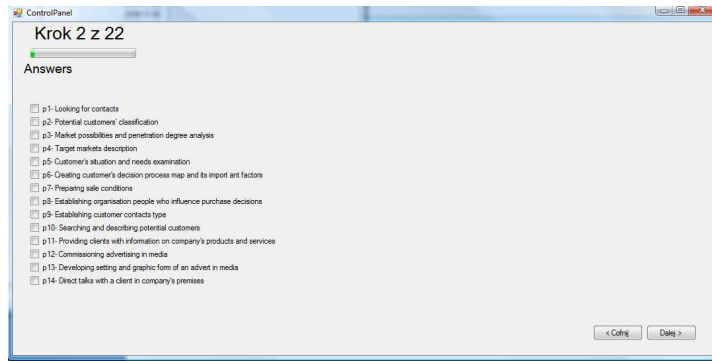
Figure 2. Sknowinnov system
Source: own elaboration

In order to obtain the value of the personnel usefulness function of each employee's in the sale area in the SME sector companies need to be made by an employee to answer the following questions (see Example figures 3, 4):
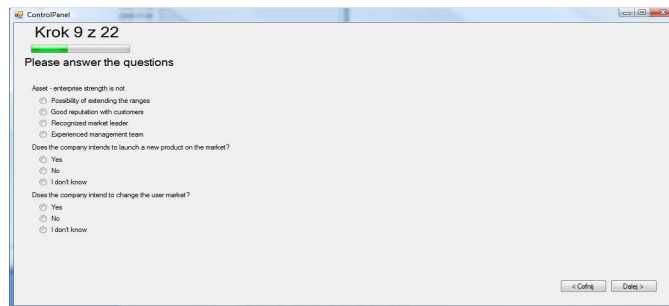

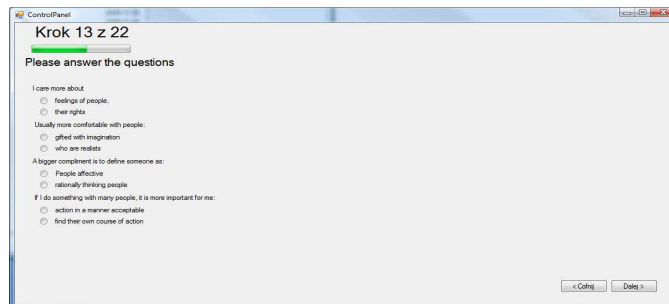Figure 3. Sknowinnov system
Source: own elaboration

Figure 4. Sknowinnov system
Source: own elaboration

After entering a user-defined data obtained by the actual value of the personnel usefulness function of personnel and its components (see figure 5).
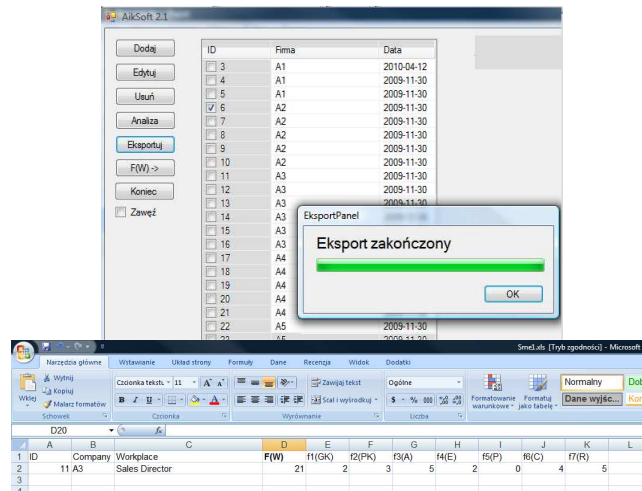
Figure 4. Sknowinnov system
Source: own elaboration

Top management may decide on employment of new staff due to the satisfactory value level of the personnel usefulness function was made on the average values of this function (see chapter 2) with relation to the value of this function of employees in the company.

5. Conclusion and directions for further work
Personnel planning is particularly important from the standpoint of efficiency management of social potential in a dynamic environment. A good plan, ability to select and use appropriate methods of planning the employment should increase the rationality of human resource activities in the real economy. The management of the organization to succeed it should operate at a strategic level planning. Proposed method for planning and selection of personnel in SME in the general management of the undertaking has the possibility of selecting a new employee on the basis of the experience of companies with similar activities (see test results) and a questionnaire assessing the new employee.

The method – the personnel usefulness function can also assist other methods, it consists in the reproduction of some of the actual situation, the processes in terms of a model with specific assumptions in order to improve their knowledge. The current state of advancement of research allows the application of this method for SME sector in line adopted reference model for the sales department for specific workplaces. The selection of employees using the proposed method is characterized by objectivity, methodical and uniformity, fairness and impartiality, professionalism. Using the personnel usefulness function should provide acquisition personnel with skilled staff, ensuring the smooth functioning of the organization over time.

Summary
The personnel usefulness function – the method for planning and selection of personnel in SME
This paper presents concept of the method for planning and selection of personnel in SME - the personnel usefulness function. This function in a company represents the knowledge, skills and capabilities of the individuals who make up the workforce of that company. In the paper I present a computer implementation of this method, which allowed for a series of tests that verify its usefulness. Such an implementation is the software system for facilitating decision making at a strategic level in terms of the profitability of investment in staff knowledge - SknowInnov system.

Streszczenie

Funkcja użyteczności personalnej – metoda planowania i doboru personelu w MSP

W artykule zaprezentowano koncepcję metody planowania i doboru personelu w przedsiębiorstwach sektora MSP – funkcję użyteczności peronalnej. Funkcja te reprezentuje wiedzę, umiejętności oraz inne przymioty pracownika oraz pozwala na określenie wartości wiedzy pracowników. Przedstawiono również implementację metody w postaci systemu informatycznego SknowInnov - *Doradczego Systemu Oceny i Prognozowania Wartości Wiedzy dla małych i średnich przedsiębiorstw.*

References

1. Armstrong M. (2001), *Human Resource Management*, Oficyna Ekonomiczna, Kraków (in polish).
2. Kostera M. (2000), *Personnel management*, PWE, Warszawa (in polish).
3. Król H., Ludwiczyński A. (2007), *Human Resource Management*, PWN, Warszawa (in polish).
4. Lichtarski J. (2000), Peronnel function and personnel management [Ed.:] Listwan T. (red.), *Zarządzanie kadrami*, Wyd. Akademii Ekonomicznej, Wrocław.
5. McKenna E., Beech N. (1997), *Human Resource Management*, Gebethner&S-ka, Warszawa (in polish).
6. Patalas-Maliszewska J., Werthner H. (2010), *Methodology of knowledge value assessment in an enterprise of SME sector*, Management and Production Engineering Review, vol. 1, no 1.
7. Pawlak Z. (2003), *Personnel business function – processes and procedures for staff*, Poltext, Warszawa (in polish).
8. Ramos-Rodriguez A.R., Ruiz-Navarro J. (2004), *Changes in the intellectual structure of strategic management research*: *A bibliometric study of the Strategic Management Journal, 1980-2000*, Strategic Management Journal, 25(10), 981– 1004. Gajek L., Kałuszka M. (2000), *Statistical inference,* WNT, Warsaw (in polish).
9. Sekuła Z. (2001), *Personnel planning*, Oficyna Ekonomiczna, Kraków (in polish).
10. Szałkowski A. (red.) (2002), *Personnel development* AE, Kraków (in polish).