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## **MANAGEMENT OF PERSONNEL PROCESSES WITH THE SUPPORT OF ICT TOOLS AND SERVICES TO ACHIEVE THEIR LONG-TERM EFFICIENCY**

**Keywords:** ICT tools, management, personnel processes, efficiency

**Słowa kluczowe:** narzędzia ICT, zarządzanie, procesy personalne, wydajność

### **Abstract**

This study focused on the area of personnel process management. Its goal was, based on content analysis and analysis of examples from practice, to identify recommendations regarding the achievement of long-term efficiency of personnel processes precisely using ICT. Concepts such as personnel processes, HRIS and e-personnel were gradually defined. The study also brought several specific findings regarding the results of the implementation of e-personalistic or the use of artificial intelligence (AI) and big data (BD) in the process of recruiting employees. An example can be a 4% increase in revenue per employee and a 20% increase in productivity when using AI in the recruitment process. The main recommendations for achieving long-term efficiency in the management of personnel processes include, for example, the implementation of HRIS for effective human resources management or the use of specific e-personnel tools leading to the decision-making support of company managers.

### **Streszczenie**

W badaniu skupiono się na obszarze zarządzania procesami personalnymi. Jego celem było, w oparciu o analizę treści i analizę przykładów z praktyki, wskazanie rekomendacji dotyczących osiągnięcia długoterminowej efektywności procesów personalnych właśnie przy wykorzystaniu ICT. Stopniowo definiowano takie pojęcia, jak procesy personalne, HRIS i e-personel. Badanie przyniosło także kilka konkretnych wniosków dotyczących efektów wdrożenia e-personalistyki czy wykorzystania sztucznej inteligencji (AI) i big data (BD) w procesie rekrutacji pracowników. Przykładem może być 4% wzrost przychodów na pracownika i 20% wzrost produktywności przy wykorzystaniu AI w procesie rekrutacji. Do głównych rekomendacji osiągnięcia długoterminowej efektywności w zarządzaniu procesami personalnymi można zaliczyć np. wdrożenie HRIS w celu efektywnego zarządzania zasobami ludzkimi czy wykorzystanie specyficznych narzędzi e-personelu prowadzących do wspomagania podejmowania decyzji przez menedżerów firm.

## **THEORETICAL BACKGROUND OF PERSONNEL PROCESSES AND THE ICT TOOLS FOR THEIR SUPPORT**

In the beginning, the analysis of the theoretical starting points focuses on the definition of basic terms in the field of *people management* in the company. Connections related to effective people management were also processed, namely personnel processes and their support through HRIS or e-personnel.

## Human Resource Management

There are many specific terms in the field of human resources. One of them is „*human resource management*“, which also includes its subset „*personnel management*“. The narrowest focus defines the term „*personalistic*“. The differences, but also the relationships between the mentioned phrases will be presented below by summarizing the opinions of various world authors.

Although human resource management (HRM) is an *internal* process of the company, it often relies on the *external* environment. Information drawn from the external environment concerns, for example, the labour market or the demographic development of the population [Vetráková, 2011].

Unlike human resource management, personnel management only deals with *the internal environment of the company*. It is an employee management process that is linked to all other business processes. This personnel management is also connected with other areas of the company such as production, logistics, marketing, etc. [Hittmár, Veselý, 2011].

It can be said that this is a strategic and pre-thought-out logical approach to human resource management. This process, on the one hand, individually and on the other hand, collectively, ensures the achievement of the company's predetermined goals [Bajzíkova et al., 2013].

Personalistic (HR) can be described as a narrowly specified area of human resource management. It focuses on *individual activities of working with people*. These activities include filling jobs, evaluating employees, calculating wages, etc. [Styblo, Urban, Vysokajova, 2005].

## Personnel Processes and HRIS

In the following sections, personnel processes, and the information system to support human resource management (HRIS) will be described separately, along with its basic modules.

### Personnel processes

There are several views on personnel processes and their definition in the functioning of the enterprise. In connection with the above-defined terms, it is possible to mention several *personnel processes*, which are the main subject of HR research (in the narrowest sense) but are also included in human resources management (in the broadest sense).

Robbins and Coutler identified the following nine personnel processes, which, according to them, are the basis for achieving the desired performance of employees [2004]:

- human resources planning,
- recruitment (acquisition) of employees,
- selection of employees,
- introduction to the workplace (orientation),
- education – training,
- work performance management,
- remuneration of employees,
- career development,
- dismissal (release) of employees.

Currently, the application of various *information and communication technologies (ICT)* is used for the planning and implementation of personnel processes to achieve effective management of human resources.

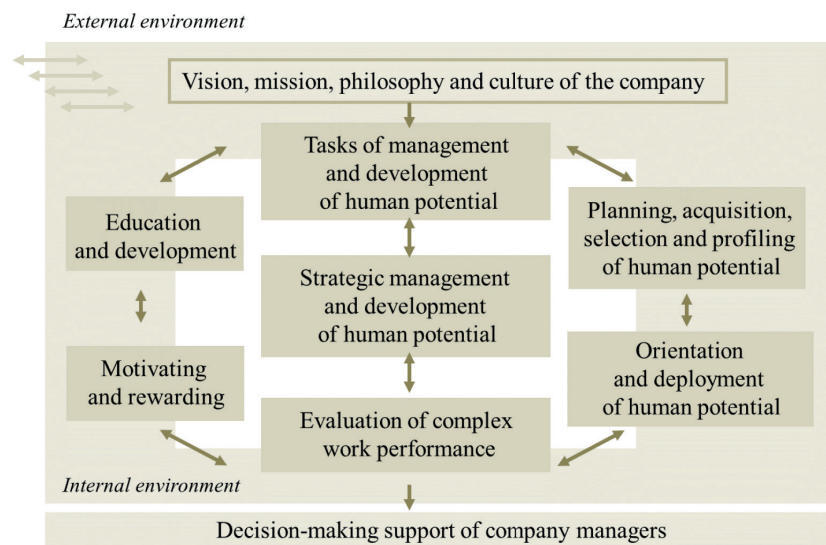
### HRIS

HRIS is one of the tools that can be used for effective human resource management. It is an information system that systematically *collects, stores and updates data related to company employees*. Companies need this information about their employees so that they can properly manage personnel processes (more efficiently, faster, more clearly, etc.) [Singh, Jindal, Samim, 2011]. In this way, the purpose of the information system for personnel management can also be defined.

The key part of HRIS is precisely *the effective work with information* related to human resources, which is used to support the decision-making of company managers (Figure 1). Based on the mentioned facts, it is also possible to define the function of HRIS, which is the provision of information necessary for

the effective implementation of personnel processes in the company. These should be ensured in the necessary *content, scope, quality, and time* [Taiř, 2012].

**Figure 1. Summary of key HRIS elements**



**Elaborated:** Hittmár, Lendel, Kubina, 2013

The given graphic representation represents a clear summarization of the key elements of HRIS. The starting point should be *the vision, mission, philosophy, and culture of the company*. Links between the *internal and external environment* also appear here, so that their connection is visible.

## Modules HRIS

Each information system includes several *modules* – areas on which it focuses. In the case of HRIS, four modules process specific areas of information.

The first area is information about employees, which is usually processed through *the employee's online personal folder*. The following is a job information module. This module focuses on *the description of the work activity and the place of work, defining the salary or other necessary criteria*, etc. The mentioned information is usually also presented to the labour market using published job offers [Tvrđíková, 2008].

Another module focuses on information about personnel activities. Information on *the progress of personnel processes, the application of HRIS within the remuneration system* or information regarding the process of selecting employees and various instructions for ensuring other personnel activities can be advised here [Hittmár, Lendel, Kubina, 2013].

The last module includes information about external conditions. Within it, information about, for example, *the situation in the labour market* can be collected and managed. This part includes the average salary, unemployment, demographic information on the free labour force, etc. The analysed module can also contain *information of a legislative nature*, such as the minimum wage, the number of hours worked, etc. [Hittmár, Lendel, Kubina, 2013].

## E-personalistic

*Electronic human resource management (E-HRM)* systems typically include a variety of software applications and online tools. These tools are designed to streamline tasks in the field of human resources and improve the overall efficiency of personnel processes. It can be stated that they contain different functional modules [Blažek, 2014].

Within the company, it is possible to perceive e-personalistic as a specific part of e-business, applicable precisely to the field of human resources management. In the developing digital world, the use of E-HRM in the company can help to improve HR processes and make the management of employees more efficient. It is the use of planned and managed support, which is based on ICT, in the implementation of personnel strategies, policies and practices in enterprises. The "IT" component represents methods

of data collection, processing, distribution, retrieval and disposal, and the “KT” component, in turn, includes methods of communication between living subjects (people) and technologies, as well as between technologies [Findikli, Rofcanin, 2016].

It is possible to state that 3 approaches of strategies and policies of e-personalistic are used. Each of the approaches can be distinguished through specific characteristics that relate to different areas of HRM. These characteristics include *employee influence, rewards, and work systems* [Nasreena, Sumatib, 2023].

One of the strategies of e-personalistic is the bureaucratic strategy. This is oriented towards standardization and control. The advantages are *long-term efficiency and cost savings throughout the company* [Varmus et al., 2022]. On the other hand, there is *low flexibility* in the system (that is, its low adaptability to circumstances). The system is usually centralized, with top-down management.

Another type is the clan strategy, which emphasizes *a strong organizational culture and the promotion of employee engagement*. This E-HRM system is designed to support collaboration, communication and knowledge sharing among employees. The system is often decentralized with a high degree of employee autonomy.

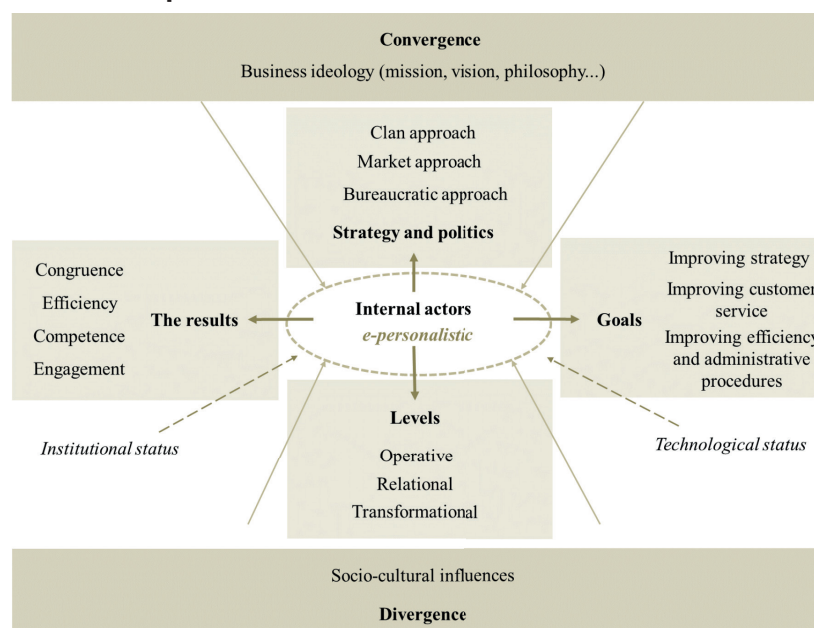
Market strategy is oriented towards *competitiveness and results*. The system supports performance management, goal setting and reward systems. The system is usually centralized, with a weaker top-down management approach.

The management of HR itself with the support of ICT can be ensured at three levels. The operational management of HR refers to basic personnel activities in the administrative area (payroll agenda, personnel data management, etc.). Relational HR management refers to more advanced activities [Holubčík, Vodák, Soviar, 2018; Holubčík, Soviar, 2021]. Emphasis is placed on supporting basic business processes (recruitment and selection of new employees, performance management and evaluation, remuneration, etc.). Transformational HR management refers to activities of a strategic nature (organizational changes, strategic management of competencies or knowledge, etc.).

### Results of the implementation of e-personalistic

Four main impacts can be expected after the implementation of e-personalistic in the company. The first is high engagement when employees are motivated and willing to communicate with management about changes in the organizational environment. Furthermore, it is a high competence, which points to the ability of employees to learn new tasks and roles. Among the main results of the use of e-personalistic is also cost efficiency.

**Figure 2. Theoretical model of e-personalistic**



**Elaborated:** Ruël, Bondarouk, Looise, 2004

This applies, for example, to the competitiveness of wage levels and employee turnover rates. Finally, it is higher compliance (match), which concerns the internal organization, the remuneration system, and the performance of employees [McNulty, 2017]. Based on the mentioned characteristics, it is also possible to create a theoretical model of e-personalistic (Figure 2).

The presented model includes several elements, factors, connections, and layers of e-personality. Key elements include strategy and policy, objectives, levels, and outcomes.

## **ANALYSIS OF THE SELECTED TECHNOLOGIES AND THEIR INTERCONNECTION WITH PERSONNEL PROCESSES**

To present specific examples of ICT implementation in HR, two areas of examples from practice were chosen. These relate to the process of recruiting (acquiring) employees, using artificial intelligence (AI) or big data (BD).

### **Use of AI in the recruitment process**

Regarding the process of acquiring a new employee, it can be stated that it is often preceded by the release of the employee from the employment relationship. In this case, artificial intelligence can predict the departure of a given employee from the job through a prediction software tool. AI examines the employee's behaviour and based on the data; determines how likely he is to resign. Thanks to this, the company can save costs, and reduce recruitment time. The mentioned software is used by companies such as *IBM, Facebook*, and others. *Bamboo HR, Job rate or Monster talent management* can be included among specific software [Edward, 2019].

After the need to hire a new employee is identified in the company, *a job offer is created*. Through optimization software, artificial intelligence can create recommendations for creating an objective and non-discriminatory job offer. The software is used, for example, by *the Cisco* company, specifically the *Textio* software [Edward, 2019].

A common cause of recruitment failure is poor targeting of the applicant segment. The process can be optimized using artificial intelligence and machine learning. *Retail stores, Netflix or YouTube* use the right targeting. Specific examples include *ClickIQ, PandoLogic, Recruitz* [Edward, 2019].

Another example of the use of AI in the recruitment process is *the analysis of resumes*. They are searched for keywords (or their synonyms). AI can also predict how likely a candidate is to accept an offer or what their productivity level will be [Choudhury et al., 2022].

The presented tool is also used *to screen potential applicants* [Edward, 2019]. AI can quickly search networks focused on career presentations (*LinkedIn, social networks*). The essence is the analysis of posts or statuses on social networks. Artificial intelligence checks every digital trace of the applicant and evaluates moods and emotions expressed on the networks [Garg, Goel, 2021].

Also, based on information about the applicant's past employers, it is possible to predict what his expected salary is [Choudhury et al., 2022].

### **Advantages and disadvantages of implementing AI**

Among the main advantages of using AI in the process of hiring employees is the efficiency of this process in the form of *a reduction in time*. Businesses have seen a 4% increase in revenue per employee and a 20% increase in productivity [Garg, Goel, 2021].

Another advantage is *the greater objectivity* of the employee recruitment process. Employees of the HR department also make decisions based on data and not just feelings. The *employees of the HR department* themselves thus improve their cognitive abilities and their emotional intelligence also changes [Choudhury et al., 2022]. Other benefits include *cost savings and the promotion of diversity in businesses*.

The disadvantage is the fact that artificial intelligence is just *a technology* that cannot show emotions and *the ability to interact on an emotional level*. Technology also *cannot think critically* and does not have its thinking and reason, so it cannot be creative [Garg, Goel, 2021]. One of the main negatives is *the removal of human contact* from the recruitment process.

## Use of BD in the recruitment process

*Google* is an example of the successful implementation of big data (BD) technology in the recruitment process. This company has created a recruiting algorithm that predicts an applicant's likelihood of success if hired. In addition, an algorithm was developed to support the review of applicant resumes with an error rate of only 1.5%.

The company has also developed an employee retention algorithm based on the use of predictive modelling. As a result, *Google* was able to quickly fill vacancies while at the same time leading to long-term low turnover [Sullivan, 2013].

## Advantages and disadvantages of BD implementation

Among the advantages of implementing BD in the process of recruiting employees is *the targeted expenditure of costs* for this process. If a company can effectively analyse where its most successful applicants come from, it can primarily focus on this area [Tyfting, 2019].

BD-based applicant analysis tools allow businesses to create a more comprehensive applicant profile. Thanks to this, it is possible to align the personal goals of the employee with those of the company [Glassdoor, 2023; Turczynski, 2023]. The use of BD can help companies to filter suitable applicants from a large number. During selection, skills, qualifications, experience, and personality traits are assessed. This automation of activities will free up space for HR department employees to focus on other work activities [Analytics insight, 2022].

A specific example is *JetBlue Airlines*, which before using BD focused on "pleasantness" as the most important attribute of flight attendants. After analysing customer data, the business found that "helpfulness" was more important in the eyes of its customers. The company then used this information to narrow down the selection of candidates more effectively [Leich, 2023]. BD allows companies to objectify factors for assessing suitable employees [Luenendonk, 2019]. As many as 52% of HR executives report that the hardest part of recruiting is identifying the right people from a large pool of applicants [Marr, 2018].

*The risk of privacy violation* can be cited as a disadvantage. When using BD to collect information about candidates, all privacy laws and regulations must be followed. The use of BD can also lead to *discrimination against candidates* based on their race, gender, age, sexual orientation, and other factors [Luenendonk, 2019].

The quality of the results depends on the accuracy and reliability of the analysed data. If *the data is incorrect or out of date*, it can lead to incorrect conclusions and decisions. At the same time, it is necessary to ensure *proper tuning of the BD*. Without proper tuning, the results could be ineffective or even unfavourable [Marr, 2018].

## RECOMMENDATIONS FOR ACHIEVING LONG-TERM EFFICIENCY OF PERSONNEL PROCESSES

Regarding the analysed areas, it was also possible to identify several recommendations for businesses. These relate to the achievement of long-term efficiency in the management of personnel processes using ICT. The main recommendations include:

- application of various information and communication technologies (ICT) in the company,
- HRIS implementation for effective human resources management,
- adaptation of HRIS and its modules for the systematic collection, storage and recovery of data related to the company's employees,
- use of one of the three e-personalistic strategies (according to the specific current needs of the company),
- the use of specific e-personalistic tools to support the decision-making of company managers,
- use of artificial intelligence (AI) in personnel processes,
- use of big data (BD) in personnel processes.

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