Features of HR-analytics using modern data analysis methods

O Polous[1]

[1] National Aviation University, 1, Liubomyra Huzara ave., Kyiv 03058, Ukraine

E-mail: polousolgavictorovna@gmail.com

Abstract. The modern highly competitive environment requires from the personnel services of enterprises the maximum attention to the assessment of the efficiency of the personnel and HR-service, which can no longer be limited only to administrative, control and accounting functions. The role of human resources in the activities of the enterprise today has increased significantly compared to the time when staff were considered solely as resources of production. World and Ukrainian practice of human resources management of the enterprise at this stage involves accounting and analysis of both real (knowledge and competencies) and virtual (behavior, organizational culture, teamwork, hobbies) components of human resources of a particular enterprise. These factors significantly increase the degree of responsibility of the HR-service, and, as a consequence, raise the issue of developing the latest methods for assessing the effectiveness of the enterprise as a whole, and this unit in particular. It should also be noted that at present there is no single, universal way to assess the effectiveness of HR-service, which could be applied to companies regardless of their type of activity. The urgency of this study is due to the new challenges facing HR-services of modern enterprises and are to find innovative ways to develop competitive advantages of the enterprise, solving relevant business problems using existing and potential human capital. All this in combination causes a shift in the focus of HR-service on operational tasks and strategic issues, making this unit an active participant in the development and implementation of competitive strategy of the company.

1. Analysis of existing methods for evaluating the effectiveness of HR-service

At the moment, the assessment of the effectiveness of HR-service includes a comprehensive methodology of J. Phillips, Dave Ulrich's model, HR-audit and consideration of HR-service as a center of profit.

Jack Phillips developed a comprehensive methodology for calculating the return on investment in HR. This technique is often used in Western companies. Phillips' five formulas for measuring HR performance are:

1. Assessment of HR investment = HR / OPEX.

2. Estimated HR investment = HR service costs / number of employees.

3. Absenteeism = Absenteeism, Absence without warning + Number of employees who quit unexpectedly.

4. Satisfaction Score = Number of employees satisfied with their job, expressed as a percentage. To determine this indicator, a questionnaire or survey method is used.

5. The criterion that determines the unity and harmony in the organization. Calculated on the basis of statistical data on productivity and labor efficiency assessment [1].

According to domestic practitioners and scientists, some indicators of the methodology proposed by Phillips are not effective enough in the economic realities of our state. For example, the last indicator of the given technique is not always possible to calculate due to the lack of relevant statistics on the enterprise, because it is simply not provided by state standards. That is, it can be concluded that the Phillips methodology can be effectively applied in enterprises that regularly manage human resources, keep relevant statistics and calculate key performance indicators.

Dave Ulrich's model allows you to analyze the quality of HR services. Dave Ulrich, an American human resources specialist and professor at the Michigan Business School, in his paper "Human Recourse Champions" in 1997 proposed five ways to measure HR performance [2]. His techniques are quite popular in the West. Within the framework of D. Ulrich's model, the indicators of business processes are compared before and after HR events. The main areas for measuring HR results are as follows:

1. An indicator of productivity / productivity (per unit of raw materials, per worker or unit of salary). This indicator is used to assess evolving procedures. For example, a company employee works several times more productively after taking courses. Hence, his training was effective.

However, in practice, it is rather difficult to single out the effectiveness after training, while other external and internal factors for the organization could also affect labor productivity.

2. Process measurement indicators (speed of passing a business procedure, technological process). This indicator is a kind of benchmarking: the passage of various procedures or a technological cycle is compared with similar indicators in other companies. Consequently, this procedure has the same difficulties as benchmarking. In addition, the measurement of the speed of business processes should be preceded by their detailed description (clear formalization). This is quite rare in the practice of domestic organizations.

3. Costs and other outcomes from special programs and initiatives are analogous to ROI.

4. Employee skills, loyalty, team morale. To assess these parameters, a questionnaire, testing or interview is used. Despite the fact that the results of such an assessment can be very indicative, it is rather difficult to assess the reasons for changes in dynamics in different periods.

5. "Organizational Capabilities" - cycle speed, learning ability, transparency.

According to Ulrich, the HR service should manage changes in organizations: on the one hand, HR managers should restrain aggressive managers, "disclose" closed ones, on the other hand, in the face of changes, constantly develop personnel. An obvious advantage of this method is the introduction of an objective indicator into the assessment of the contribution of the HR service to the development of the company. However, it should be borne in mind that assessing the speed of a certain business process requires its alignment and measurability of indicators.

HR audit is a tool for measuring the effectiveness of human resource management, the main purpose of which is to identify the strengths and weaknesses of the HR service, develop recommendations on their basis for changing business processes in the field of human resources with the maximum result in the shortest possible time.

The object of an HR audit is both personnel management in general and individual areas of using the organization's human resources. The subject of HR audit, as a rule, are external consultants, however, in the case of temporary isolation of the organization's employees from the production process and subject to exclusion from organizational subordination, this function can also be performed by employees of the audited organization.

HR audit is built in accordance with the principles inherent in the audit activity in general, namely: independence, implying objectivity and honesty of judgments, professionalism, confidentiality, professional behavior [3].

The method of assessing the effectiveness of human resource management as a profit center assumes that the HR service provides services to other departments of the company for a certain fee. The cost of the services provided can either correspond to market prices for such services, or be lower.

With this approach, the HR department acts as a unit that can generate income. The performance in this case is assessed by the profit received, on a common basis with other business units. However, this method does not allow assessing the effectiveness of human resource management technologies.

It should also be noted that there is a lack of unity in understanding the concept of "HR-analytics".

For the first time the term "HR-analyst" was used in the paper «HR Metrics and Analytics: Use and Impact» author E. Lawler, A. Levenson, J. Boudreau in journal Human Resource Planning [4]. Its scope is quite wide: it is to obtain information for management decisions, and data to optimize business processes, and the ability to identify and eliminate the cause of any problem and more.

In Global Labor Market Survey this concept is defined as:

- collection, processing, normalization and analysis of data using mathematical models, search for hidden dependencies and correlations;

- identifying the most promising opportunities to positively influence business performance through HR data;

- analysis of the root causes of the identified problems, identification of opportunities for improvement and their implementation [5].

Based on the results of the Deloitte study "International Trends in Human Resource Management in 2017" [6], with over 10,000 corporate executives and HR experts from 140 countries participating, HR analytics is currently one of the top ten priority areas for companies to focus on in order to improve organization, governance, development and employee engagement.

Thus, HR analytics today remains a priority, but insufficiently studied area of knowledge, which requires a more detailed consideration and highlighting key problem areas in order to optimize the work of HR services of domestic enterprises and maximize the benefits from the use of human resources.

2. Modern methods of data analysis and their application in HR-analytics

The benefits of an analytical approach are numerous, especially when it comes to enterprise human resource management. The MIT Sloan Management Review, in partnership with the IBM Institute for Business Value, of nearly 3,000 CEOs, managers, and analysts across more than 30 industries and 100 countries, found that top performing companies use analytics five times more often than others [7].

Every year more and more companies automate the HR function and thereby simplify and make the work of recruiters and HR managers more efficient.

9 out of 10 companies have automated their HR processes in one way or another, according to a new study by HeadHunter Ukraine "Digital in HR" [8]. In particular, thanks to such automation, personnel records and personnel administration were optimized in almost half of the cases, a third of companies simplified internal communications, and another quarter began to more efficiently recruit personnel.

Increased adoption of HR analytics is expected in 2019-2020 to achieve better business results. The benefits of investing in HR analytics are obvious: collecting and analyzing employee data allows you to build an effective company strategy and save resources. With the help of tools such as Big Data and Data mining, you can improve the quality and cost of hiring, predict and increase the ROI of any HR practice. In confirmation - the results of the Visier study: the profit of companies in which HR analytics is conducted turned out to be 56% higher than that of colleagues without it.

n 2019, the global recruiting software market reached $ 2 billion. Companies are willingly implementing HRIS (human resources information system), which automate the search, recruitment and management of personnel. Most often they invest in HCM (human capital management) systems and ATS (applicant tracking systems) modules. All this speaks about the global automation of the HR-sphere, which is worth paying attention to. After all, as HR experts say, refusing software, you risk losing the best staff.

Moreover, due to automation, internal HR departments will decrease and outsourcing will increase. So the founder of TechVentive, industrial analyst Brian Sommer, believes that in the next 5 years, a

transition to smaller HR departments is foreseen. This will help companies significantly save resources and develop versatile HR professionals.

A well-promoted HR brand attracts valuable talent, retains the best employees, and increases work engagement. According to research by LinkedIn, 75% of candidates research a company's reputation before submitting a resume. Of these, 69% of applicants are not ready to get a job in a company with a dubious reputation, even if they are unemployed [9].

The following can help to form a positive image of the company:

- unique EVP (Employer Value Proposition) - tell job seekers how you compare favorably with other companies;

- content strategy - broadcast the company's mission using corporate content (employee blogs - brand ambassadors, media, events, etc.). Track the latest trends in the job market and the desires of candidates. Based on them, create a non-standard creative that you want to share. This will help optimize the costs of promoting your HR brand;

- HR sites. Be sure to launch a career site with vacancies, where you show the atmosphere in the office, a photo from the last corporate party, describe the company's values and career opportunities.

Among the most popular tools for HR digitalization and recruitment are the following [10]:

- Zoho People – it is an information system where the HR manager can record important information immediately in the interface, without unnecessary details. The system provides the following functions: employee portal, self-service portal, organizational structure, checklists for business processes, etc. Advantages of Zoho People: HR analytics; Electronic signature; Accounting for hours worked; Absence management; Simple designer of templates and forms; Functional for performance review; Functions for automation of routine HR-tasks; A set of templates for popular HR documents; Integrated analytics and reporting; Web and mobile version;

- BambooHR – software for HR-managers in small and medium business. Includes a wide range of personnel management and recruitment processes and can be supplemented with payroll tools. Advantages of BambooHR:

1) automate the search for data on relevant candidates and its tracking:

2) manage large amounts of data about employees and applicants;

3) differentiation of access rights for different types of users;

4) detailed analytics, integration with many tools, flexible configuration of interface elements;

5) manage employee training, create and customize processes, built-in calendar and detailed FAQ;

- Workable – online system for managing recruitment processes. This solution combines a candidate tracking system (ATS - Applicant Tracking System) and a recruitment platform with a powerful search engine, sharpened to search for relevant resumes on the Internet and job search sites. Advantages of Workable: Recruitment and Candidate Management; publish to work sites in one click; interface branding in the style of your company; search for candidates through social networks; designer of questionnaires and vacancies; collaboration when creating a resume; very fast resume parsing; letter templates, mass-mailing, database of candidates' email addresses; task schedule for the HR department; convenient import of existing databases; phone and email support, personal manager; add-on for Google Chrome for quick candidate search.;

- Hurma System – recent addition to the HRM / HRIS market. It is a comprehensive solution for HR, recruitment and OKR in one system. From the first contact with the candidate, going through all the stages of the recruitment funnel, to his transfer to the staff, onboarding, adaptation, maintenance and even mood monitoring. Advantages of Hurma System:

1) AI Partner - chatbot for Telegram, Slack, Viber based on artificial intelligence to improve the communication between the company and the employee;

2) Automation Welcome interview, Adaptation, Probation, 1: 1, Exit interview;

3) Organizational structure of the company in a convenient tree;

4) Notification of company events and happenings;

5) Sync with Google Calendar;

6) Statistics on children of employees;

7) Monitoring the mood of employees;

8) Statistics on HR and recruitment;

9) General calendar of vacations, sick leave, at his own expense and other types of absences for all employees;

10) Absence management;

11) Request a 1: 1 employee and other meetings with HR and management;

12) Personal profile of a company employee;

13) Employee cards;

14) Performance management;

15) OKR - Objectives and Key Results, company goal management;

16) Publication of vacancies on the company's website;

17) Base of candidates for the recruiter;

18) Vacancy database of the company;

19) Import candidates from other systems;

20) Parsing CV from different file types;

21) Integration with work portals.

It should be noted that the annual license for the Ukrainian product Hurma System is 4-6 times cheaper than for foreign counterparts, and the client gets almost all the necessary functionality for HR-manager and recruiter from the start. In addition, the prices of competitors are specified for the basic versions of the product and their further adjustment to the needs of the business will require additional investment.

At the same time, Hurma System is being actively refined, so buying it, the company will be able to automate most of the routine tasks, and in a couple of months to get the necessary functions for free.

Thus, automation in the field of human resource management is increasingly aimed at optimizing HR processes, and digitalization contributes to the integration of technological solutions and innovations to increase the value of the product and maximize profits. HR analytics is most effectively performed on the basis of Big Data and artificial intelligence (AI) (Fig. 1).
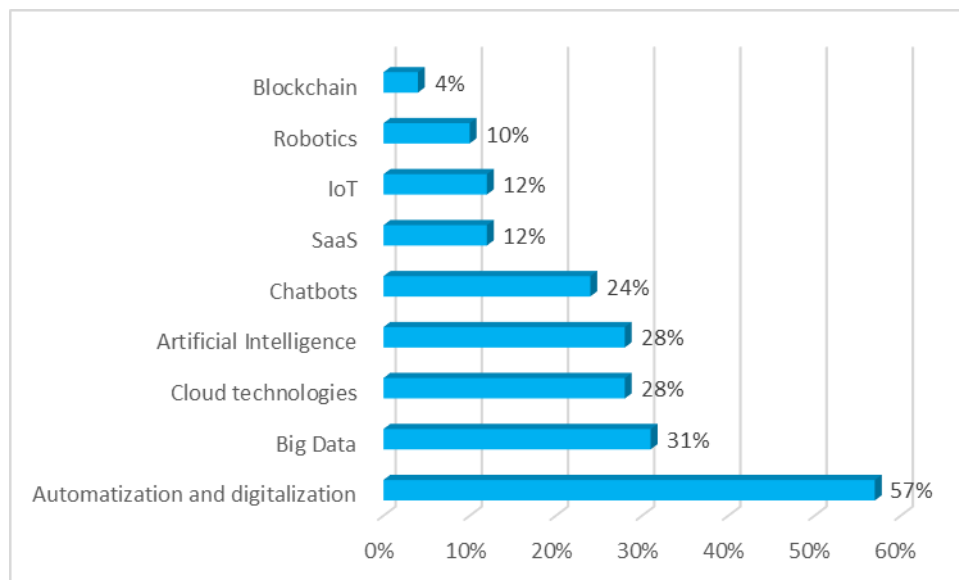

Figure 1. Widespread technologies and innovative trends for HR development

With the help of Big Data, the analysis of the work of individual divisions of the company is carried out, based on the information received, management decisions are made. Also, big data is used

for HR work. They make it easier to find employees and select those who are best suited for a specific position. Big Data also helps:

- automate the selection of candidates;
- evaluate the efficiency of employees;
- speed up the adaptation period;
- increase labor productivity;
- predict the success of the employee;
- develop talents;
- retain valuable employees.

Big Data solutions greatly facilitate the work of HR specialists. These tools primarily improve the technologies that can be used to recruit and manage talent. Basic statistical software is sufficient to process the data. It can be, for example, a corporate HR management system based on cloud services such as Success Factors or a regular Excel.

To successfully use Big Data, the HR specialist himself does not need to be a programmer or have any unique technical knowledge. But he must be able to make decisions, filter information and know what result he wants to achieve.

The joint work of HR specialists and Big Data programmers will be productive. HR in this case is responsible for the content, and the programmer is responsible for the technical implementation of the conceived. For example, it is the HR specialist who should propose the parameters that need to be included in the model for finding employees.

The introduction of technology has long been not limited to IT companies. Traditional businesses are beginning to actively develop effective business solutions either through their own teams or by working with startups as providers of innovation and technology. Consequently, the use of Big Data technologies in the HR-sphere, in particular when developing forecasts of staff turnover, enables company leaders to work ahead of the curve and gain an incredible competitive advantage. Unlike traditional business intelligence, Big Data - the ability to store gigantic amounts of memory - allows you to "go down" to the level of each client, and this personalizes the approach to the client.

Also, during the quarantine, the demand for HR adaptation to external changes grew rapidly, associated with new global challenges and opportunities. On the other hand, the focus on people as a trend turned out to be quite contradictory: some companies will continue to focus on the "internal client," that is, the employee, and some will focus on optimizing business processes due to this trend.

References
[1] Phillips J and Patti P Phillips 2017 Six Ways to Show the Value of HR Programs. https://roiinstitute.net/six-ways-show-value-hr-programs-patti-jack-phillips/
[2] Ulrich D 1997 Human Resource Champions: The Next Agenda for Adding Value and Delivery Results. Harvard Business School Press
[3] Stuss M M 2013 Personal audit as a modern human resources management tool. Jagiellonian University
[4] Lawler, Edward E, III, et al. 2004 HR metrics and analytics: use and impact. *Human Resource Planning*, vol 27 no. 4, Dec 2004
[5] Global Labor Market Survey https://conference-board.org/topics/global-labor-market-outlook
[6] Deloitte Global Human Capital Trends 2017 https://www2.deloitte.com/us/en/pages/human-capital/articles/introduction-human-capital-trends.html
[7] MIT Sloan Management Review. Official site https://sloanreview.mit.edu/
[8] Digital в HR. HeadHunter Ukraine https://grc.ua/article/20133
[9] LinkedIn Official site https://www.linkedin.com/company/hr-portal
[10] Porivnyannya populyarnyh HR-system. Shcho obraty s chomu? https://hurma.work/blog/porivnyannya-populyarnih-hr-sistem-shho-obrati-i-chomu/