

# Transformation of the HR Management in Modern Organizations

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**Abstract**— In the framework of the modern management paradigm, human being is the key resource of the organization, however, with the beginning of the fourth industrial revolution in certain areas the human activity is being replaced by an artificial intelligence, which brings both threats and opportunities. On one hand, labor automatization is taking jobs away from the middle class but on the other, it provides opportunities for lucrative cooperation between humans and digital technologies in various professional spheres, including management. Due to this fact, organization's employment management is also changing - new job roles are being created and gaining popularity, new recruitment approaches are appearing, development and training methods are changing, the price of staff turnover is increasing. It is obvious that the use of artificial intelligence in people's lives are on increase, however, the question of the best combination of human creativity and data processing capabilities by artificial intelligence remains open.

This article attempts to summarize the new experience in personnel management of modern organizations using digital technologies. Russia is also on the verge of changes in the economic sphere. The efficiency of the country's economics largely depends on the ability of Russian authorities and business structures to change according to the global trends. The authors focus on the practices in personnel management both in Russia and abroad.

Also the article highlights position of different scientists that the development of HR analytics is complicated by the lack of analytical thinking on the part of HR specialists which leads to the negative consequences for both employees and HR specialists, and the organization as a whole.

The author makes suggestion about the prospects of the artificial intelligence in personnel management in Russia, taking into account the existing restrictions for foreign software utilization, domestic software implementation according to the national specifics.

**Keywords:** *artificial intelligence, personnel management, the fourth industrial revolution, augmentation, HR analytics*

## I. INTRODUCTION

Modern life claims organizations to follow new requirements for the implementation of new business processes. These changes affect all areas of management: machines replaced human labor from heavy and dangerous workloads (during the first technical revolution), assembling vehicles and hardware; routine work has also become the field of activity for the automated systems (during the second

technical revolution), for example, ordering tickets to the cinema, theater, railway and air tickets; modern digital technologies allow you to analyze a huge amount of data, forming cognitive systems (the third era of automation). It is now widely believed that robots and systems using artificial intelligence will take away people's jobs in the intellectual sphere, as they do not suffer from the shortcomings that are usual to a person in the workplace – laziness, procrastination, restrictionism. According to a study by Erik Brynjolfsson and Andrew McAfee [1] the median income of the US population has already begun to fall, only in recent years there has been a growth of employment in the private sector, despite a significant growth in real GDP and labor productivity, which indicates an erosion of the middle class, that is, a reduction in demand for labor force without higher education or skills). However, the augmentation strategy states the opposite — a person is able to find new opportunities to perform work tasks through automation [2]. Let us consider an example in HR management: what processes can be (and should be!) automated to achieve the best results, and what to leave to the staff (something that no one can cope with better than a human being).

## II. GLOBAL TRENDS IN HR-ANALYTICS

One of the modern trends in management is sustainable development, which also affected the HR sphere, as it is the person who holds the competitive advantage of the organization, whose competencies effect a success of the whole business and its stable development. In the war for talent, managers want to be sure that having won the fight for the best specialists, they will be able to keep them, taking signals of reduced motivation or desire to change jobs. In addition, the information growth is so fast that the human resource is unable to cope with such large volumes, the analysis of incoming data becomes time-consuming and financially costly. In this case, HR analytics comes to help.

HR-analytics is a young trend in management, based on the collection and analysis of large amount of data using automated systems, based on its results the manager makes a balanced management decision. HR analytics is divided into three types: descriptive, predictive, and prescriptive [3].

Big Data processing is necessary not only for large organizations, where different approaches to the implementation of HR-processes involving a large number of unstructured data are already in use, but also for small ones in order to have a better understanding of the personnel

component. Big Data enables comprehensive collection and analysis of human capital, covering all nine areas of HR analytics (analysis of key skills of staff, analysis of recruiting and managing talent, development analytics of the staff utilization, analysis of turnover, analysis of corporate culture, analysis of the channels of recruitment, leadership analytics, analysis of individual results of employees, analysis of group interaction) [4].

Leading researcher in the field of talent management Josh Bersin highlights a separate direction in Big Data talent analytics, through which it is possible to get new information on four levels. Level 1 – reactive-operational reporting, which includes operational reporting and measurement of efficiency and compliance, data exploration and integration, development of data dictionary. Level 2 – proactive-advanced reporting, which involves operational reporting for benchmarking and decision-making, multidimensional analysis and dashboards. Level 3 – strategic analytics helps to make segmentation, statistical analysis, development of "people models", analysis of dimensions to understand cause and delivery of actionable solutions. Level 4 – predictive analytics which makes a possibility of developing predictive models, scenario planning, risk analysis and mitigation, integration with strategic planning [5]. Therefore, HR analytics is a powerful tool for qualitative analysis of personnel and determining ways to improve their professional characteristics.

Collected and analyzed data on employees and the environment help to find a connection with various business indicators, such as revenue, costs, number of contracts, number of errors, staff turnover, etc. According to research conducted by PriceWaterhouseCoopers investments into HR analytics are growing. According to the survey, 86% of companies see the creation or development of such a function as one of their priorities for the next 1-3 years, and 46% already have such functional unit [6]. Companies are interested in the new approaches because of the large volume of routine procedures associated with the integration of data from different internal sources and the need to manually combine these data. The main barriers to the implementation of HR analytics are the fragmentation and incompleteness of data at the stage of collection and the lack of sufficient competence and experience of employees to use HR analytics tools.

Let's take a closer look at each of the areas of HR management and the possibilities of using digital technologies.

### III. RECRUITING

For different categories of personnel, the modern employers use a range of different digital technologies. For example, chatbots are used to hire low-skilled line personnel. Chatbot is an automated system that simulates communication with a person, which is successfully used in mass recruitment. The bot is able to briefly describe the vacancy, correlate the information received from the candidate (the program is able to ask basic questions to the candidate about his/her education, work experience, skills, driver's license, etc.), vacancy criteria, and if the person meets the stated requirements, then clarify the candidate's convenient time for the meeting. If the bot is connected to the calendar of meetings with candidates, the program is able

to fill it without overlaps. The bot fills out an application for a candidate, which is then viewed by the recruiter during the interview [7]. The technology has already been used by some Russian companies, for example, the leading company of modern retail X5 Retail Group.

Personnel in a modern organization is its key resource. The successful future of the organization depends on the professionalism and talent of the employees. For example, some organizations use websites to attract graduates, integrated with internal HR systems. Students can be taken to the company for a period of practice or internship and then become employees. In Russia a similar practice is used by "Domodedovo", in cooperation with such universities as the Peoples' Friendship University of Russia and Russian State Humanitarian University.

In addition, modern recruitment platforms conduct the primary selection of CVs of the most suitable candidates for the position in accordance with the established selection criteria. An interview is then conducted. The interviewing process is increasingly becoming automated. On the basis of recruitment platforms such as VCV and SKILLAZ, the first video interview for the job role with a candidate is conducted, which may consist of answers to questions submitted by the employer and / or solving problems aimed at checking the candidate's various competencies (personal, general, professional, etc.). As a rule, the time for the answer or problem solution is limited. The candidate's answers are recorded on video, the structure and format of the traditional interview are saved, the recording takes place in real time. The obvious advantage of using recruitment platforms is a greater coverage of the audience of potential candidates for the job role, all the routine work of selecting a candidate is automated. Recruiters can only focus on suitable candidates. The system maintains a database of candidates and, if necessary, you can return to a particular candidate. However, there are drawbacks to this approach. First, not all candidates feel confident answering questions to the camera. This is a specific experience. Secondly, automated systems have no intuition that is sometimes needed to see a person's potential, not just the ability to solve problems on time or answer questions in front of the camera.

Another assistant recruiter is a robot that analyzes human emotions better than the person (such developments are conducted in the media Lab MIT). It is known that conducting interviews is a great art. The interviewer must have the skills not only to conduct a traditional interview, but also to be able to carry out linguistic analysis of speech and read non-verbal signals (e.g., oculomotor reactions), as well as to analyze this information and interpret it correctly. Without special training, it is almost impossible to conduct interviews in real time at a high level using the above-mentioned techniques.

Another block of candidate selection software is aimed at assessing the candidate's profile not only for the job role for which employer is applying, but for other vacancies which are open at the organization. The Russian employer is used to evaluate the candidate on the basis of work experience, but modern Western companies are increasingly paying attention to the candidate's profile as a whole, which includes not only education and work experience, but also hobbies, self-education, participation in public activities, and also may

include analysis of electronic mail, mail traffic, business trips and meetings, geolocation data, Internet browsing history, etc. Also, depending on the job role, the employee profile may contain information about the employee's performance, information about complaints, disciplinary actions, awards, internal communications and participation in projects [8].

#### IV. TRAINING

However, the need for staff does not always means looking for candidates from the outside the organization. When the question of finding new staff with high technical qualifications arose, the management of the American multinational telecommunications conglomerate AT&T decided to retrain its own employees. The decision by management set an ambitious goal to review the number of job roles, their inherent responsibilities and skills, and to align the skills of employees with the new roles. This approach is dictated, firstly, by the large shortage of technical specialists on the labor market, and secondly, by the costs associated with hiring and retaining new employees. Wide opportunities for training are opened by online courses placed on open educational platforms. Georgia Institute of technology, Udacity and AT&T have developed an online program that allows users to obtain an official master's degree in computer science [9].

Another approach is to create a corporate bank of distance learning programs (LMS – learning management system), accessible to all employees from any device (computer, tablet, smartphone), so that they can learn quickly and at a convenient time. A step forward is the creation of public content by employees themselves (e.g., EdCast).

#### V. PERSONNEL DEVELOPMENT AND CAREER MANAGEMENT

Modern career development has ceased to be linear. Employees have the opportunity to develop not only “from the bottom up”, but also horizontally, changing the specialization or sector of the economics, and diagonally, working in a related specialty in another job role. Targeted professional development advice can be provided by an online program that can assess professional qualities, work experience and qualifications of an employee, identifying his / her strengths and outlining a career development plan [9]. By comparing the information obtained from the description of new job role, it is possible to understand what knowledge should be acquired. The same program finds vacancies in other divisions of the company and advises on resources which will help to master the required skills. Another program is able to analyze recruitment trends on the labor market, taking into account the job role and salary, showing how many people apply for a position in a certain area and which companies offer vacancies for the required position [9]. For example, the Pymetrics program uses behavioral science and artificial intelligence technology to evaluate a person's professional data and suggest the most suitable job. The emphasis of the developers is on the absence of bias of the results. In Pymetrics, a playful approach is practiced, whereby the candidate for the job role and the employer are offered roles that are suitable for the current employee of the organization. The developers claim that the hiring time is reduced by 75%, with the help of the program you can attract twice as many candidates, up to 50% of employees can be kept in the workplace if they want to change their job roles,

in 98% of cases, the ways of candidate's professional improvement are identified [10].

Working simulators (real time collective simulators), which simulate working (usually stressful) situations for employees, are currently widely used. On one hand, the program helps to understand whether a person is suitable for one or another job role or not. On the other hand, the simulation of the working situation keeps the employee alert and ready to act when facing real difficulties. For example, in “Domodedovo” there is a simulator DME Live for both employees and general public (application in Google Play). For employees, a business game is held for two days with a set of different situations from the life of the airport, the purpose of which is to earn as much money as possible within the established rules of the game [11]. The simulator allows employees to receive a personal feeling, perhaps, the joy of professional self-realization, which then can lead to making the right choice of career development strategy. This is especially important for young professionals and undergraduates. Thus, digital technologies enable smart career planning. Some of the intellectual workers will be able to make a “step up”, rising to a step higher in professional experience. Some will “step aside” and do what the computer can't do. Some will make a “step inside”, and he will monitor the operation of the computer and adjust it. Others will move to a more “narrow step”, going into a very narrow specialization, and finally some will be able to make a “step forward”, working on the creation of new generation of the machines [2].

Another important area of personnel assessment is the assessment of their health. According to the head of “Domodedovo” Dmitry Kamenshchik human health determines the character, the canonical elements of the personality structure: will, intelligence, motivation and qualities of the social spectrum." People have been using techniques and programs that measure their heartbeat, number of steps, burned calories, etc. for personal use for a long time. But will the employee allow such data to be collected for the purposes of the employer? It is an open question. However, such inventions already exist combined by the doctrine of physiolytics [12].

Besides the information about employee's mood and morale can be taken from the his/her status updates, which he/she posts on personal blog or social media pages, analyzed and interpreted by the program and recorded in the employee's profile for a better understanding of what employees do and how they feel in the workplace. However, there are important privacy, consent and ethics issues in the storage and analysis of HR data [8].

Dismissal forecasting. Preventing staff turnover is one of the most important tasks of a modern organization. According to experts, with employee dismissal, up to 80% of his/ her work skills are lost, according to other estimates it is up to 400% of his/her annual income [13]. Predictive Analytics systems based on the profiles of employees which left the business can prevent the departure of particularly valuable employees, helping to identify key factors that influence the employee's decision to leave the company. It is important to collect as much information about the employee; however, the information must be complete and whole. By analyzing numerous data, the predictive system

identifies patterns that are similar to the behavior of resigned employees. As a rule, the decision to resign is influenced not by one factor, but by several, and the reasons may differ depending on the specialty and the level of the job role. Predictive model is a forecast of layoffs for each employee, which helps the company to adjust the HR strategy and make more informed management decisions.

## VI. CONCLUSIONS

There is a large number of proposals on the market of digital technologies for processing big data about personnel. However, the key question is still remaining — how to expertly and skillfully combine the intuition and professionalism of the HR manager and the capabilities of modern software. It seems that HR analytics should be based primarily on a deep understanding of the data and the context in which it is collected in order to generate meaningful insights [8]. There is still a problem of applying all the possibilities of artificial intelligence in HR practice. There are few examples of Russian companies which use the achievements of the digital age, but among the leading companies are large Russian businesses (Sberbank, Domodedovo, X5 Retail Group, etc.). This is due to the limitations of the legislation for the use of foreign software, and the specifics of the Russian HR management, accustomed to rely on intuition and personal acquaintances. However, the market of Russian software based on artificial intelligence for the needs of HR management is growing – “we do not need to wait for the digital revolution in HR – it has already begun” [14].

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