

# PEOPLE DATA ANALYTICS AS A NEW APPROACH TO HUMAN RESOURCE MANAGEMENT

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## **Abstract**

The present paper demonstrates the opportunities of using People Data Analytics technology for a data-driven approach to Human Resource Management along with Big Data and HR Analytics. Our aim was to study the most popular trends in collecting, analyzing, and using workforce data and suggest the ways companies can improve their Human Resource Management by incorporating data and analytics technologies into their people analytics strategies. Drawing on our analysis of the approaches to using People Data Analytics in Human Resource Management, we identify the key applications and services that can be employed, describe data to be analyzed, single out specific methods and technologies, suggest prospects for the development of HR functions to provide better insights into employee performance levels and deliver sustainable competitive advantage. We outline the main characteristics and competencies required for any professional involved in People Data Analytics and offer a framework for the educational program in People Data Analytics. It is imperative for the program to include courses in Statistics, Econometrics, Employee Performance Evaluation, Data Visualization, as well as Use of Data Processing Software.

**Key words:** Human Resource Management, Digital Economy, Big Data, HR Analytics, People Data Analytics

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## **Introduction**

Current changes of the society are bound to affect almost every aspect of human activities. Development of digital technologies, blurring of distinction between the digital and real worlds, growing importance of digital information for decision-making process are considered to be the key changes nowadays.

The main actors of the ongoing changes are people themselves—the ones who use digital technologies increasingly often, spend plenty of time on the Internet, use gadgets for most of the important actions and so on. It cannot but affect the approaches used by the business

sector to interact with employees, customers, and everyone who can be involved in the relationship chains of the organization with the world in one way or another.

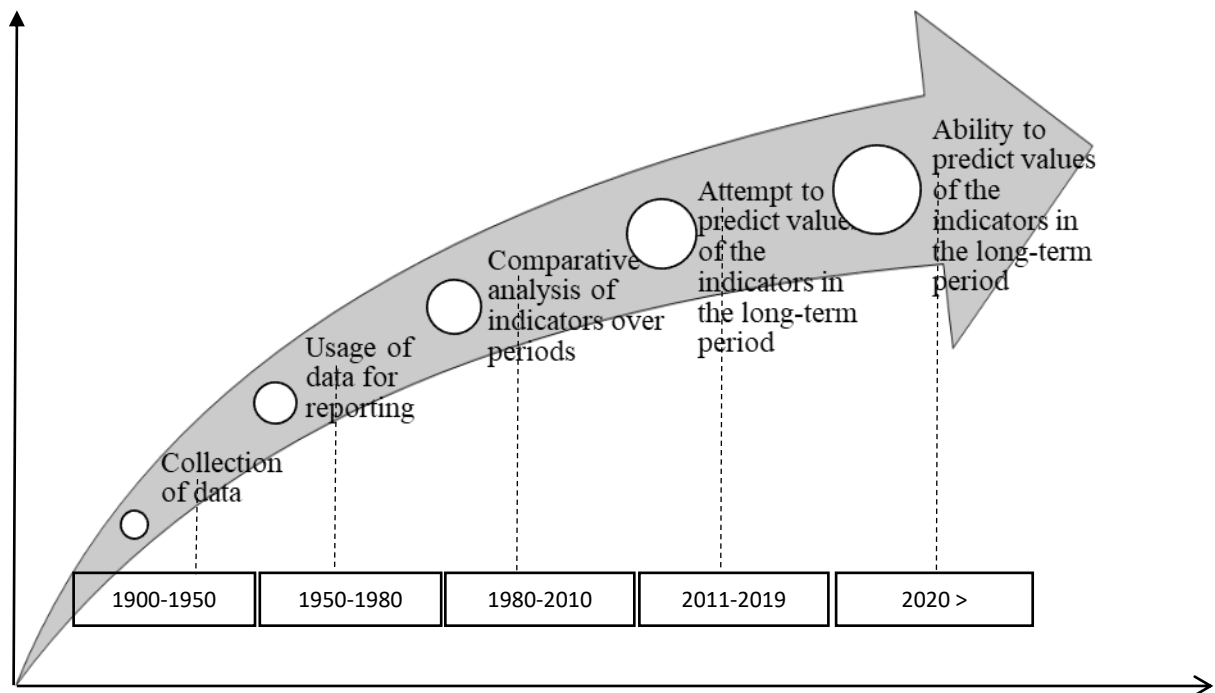
New approaches to Human Resource Management include the widespread use of the Internet for recruiting (Roshin, 2017), new services for communication with the jobseekers (such as Robot Vera, the most known service at the moment), registration of all the data about people and their work in ERP systems, analysis of the data on employees with the help of special software systems (Vorobiev, 2015), etc. The information generated in all these areas of human resources management is extremely valuable. The existing technologies already allow us to analyze this information more and more efficiently. These technologies include Big Data, HR Analytics, Predictive Parsing, and finally People Data Analytics which is one of the most relevant and promising trends in workforce data usage for addressing organizational tasks.

This research focuses on this trend. The objective of this paper is to describe how companies can improve their Human Resource Management based on the study of the most popular trends in collection, analysis, and usage of the workforce data.

## **1 Theoretical Basis of People Data Analytics Approach**

If one looks at the development of data usage, one can see an enduring interest in the matter since the beginning of the 20th century. The first stage involves collection of the information and the first attempts to analyze it in order to make management decisions, but since the second half of the century, more and more people start to use special analytical tools in order to estimate prospective changes of the specific indicators. The beginning of the 21st century is characterized by the development of digital technologies and global reach of the Internet which allowed to collect and analyze large amounts of data. Evolution of the trends of collection, analysis, and usage of the data over the last century is shown in Figure 1.

**Fig. 1. Evolution of the trends in collection, analysis, and usage of data in management decision-making**



*Source: author's work*

For further discussion of the topic, it is necessary to distinguish the following terms: People Data Analytics, Big Data, and HR Analytics.

It is widely believed that introduction of the term "Big Data" refers to C. Lynch, editor of the Nature magazine, who in 2008 prepared a special issue of the magazine with the following topic: how technologies allowing processing of large amounts of data can affect the future of science? (Kornev, 2018) Since 2009 this term has been widely used by the business press, but it became widespread only when Gartner singled out Big Data as one of the two key trends of our time in the Hype Cycle in 2011 (Izmailkova, 2015). However, in 2015 this trend was excluded from it for the trend has been developed to the necessary level and has become a common phenomenon in the everyday practice of IT companies.

Our review of the references shows that this term was discreetly used before in particular by C. Tilly who mentions Big Data in the paper "Old New Social Hist. & New Old Social Hist" (Tilly, 1980) when writing about major problems that humanity is facing. Besides, R. Williams in 2003 noted that Big Data is not a pile of dusty tapes, but a gold mine (Berman, 2003).

If we refer to big companies that employ a large number of employees working with a huge number of customers, transactions, and products, all these signs manifest themselves to the

full extent. This is what the report "Big Data Doesn't Mean 'Big Brother': Employee Trust and the Next Generation of Human Capital Analytics" is about (Young, 2016).

HR Analytics is another trend that arouses interest for the past 20 years (Angrave, 2016). This term is mostly mentioned in reference to the process of systematic collection and analysis of the workforce data to develop management decisions for implementation of the business goals of the company. It is also widely believed that HR Analytics means collection, processing, normalization, and analysis of the workforce data with the help of mathematical models and information systems as well as search for hidden dependencies and relations for management decision-making. In the second case, the decision-making techniques based primarily on mathematical models and IT solutions are specified more clearly.

The researchers and practitioners usually associate HR Analytics with such techniques as calculation of the HR metrics, talent management (McIlvaine, 2017), workforce data visualization, search for the insights for Human Resource Management (Dignan, 2017).

Considering the current level of development of the utilized technologies and skills usually developed by specialists in the field of human resource management, it can be said that HR Analytics has now more to do with the search for relations between HR metrics and business indicators which is confirmed by our analysis of trends in the field of personnel management conducted earlier (Dolzhenko, 2018).

Indeed, since there is not much substantial increase in knowledge and techniques in the field of HR Analytics, more and more experts, scientists, and practitioners recently realize that it is necessary to increase the application area of the data for business management decision-making and analyze not only the data on employees and the results of their work, but also the information on what is happening outside the company. This trend is implemented in the People Data Analytics approach (Chakrabarti, 2017).

The term "People Data Analytics" was first mentioned in 2013. With respect to the field of Human Resource Management, in the works of 2013 People Data Analytics was considered as a set of the workforce data stored in the company's information systems which is supposed to describe behavior and characteristics of the employees (there is no generally accepted term similar to People Data Analytics in the Russian scientific and practical literature, so we suggest to translate it as "data on people"). However, in 2018 the study of Deloitte allocated this trend in a separate category, redefined and widened it to describe a full set of data on people inside (employees, managers and their relatives) and outside (customers, public sector, authorities, residents of the city/region/country) the company. In this context, the amount of

data, their area of application, as well as the risks associated with leak and improper use of the data by competitors and other stakeholders significantly increase (Bersin, 2017).

Comparison of these terms allows us to conclude that Big Data and HR Analytics are in the first place tools for working with data. The first term deals with digital processing of large amounts of data on the basis of machine learning. The second term deals with analysis of the workforce data on the basis of search for relations between the indicators. People Data Analytics is a common approach to utilization of the entire range of the data obtained both from outside and inside the company for management decision-making. While the first two approaches to a greater extent are associated with data processing technologies, the latter covers wider aspects of data usage, a much wider range of information sources and possible areas of application of the analytical results.

### ***Uses of People Data Analytics for Human Resource Management***

What are the benefits of People Data Analytics for a company? First of all, they can be associated with business metrics. Analysis of hidden relations between different indicators allows us to influence those that affect the Key Performance Indicators (KPI) and can facilitate their implementation. Moreover, we refer even to those indicators that do not affect company's results directly, but correlate with them indirectly or are not subject to logical understanding. Labor productivity and personnel loyalty are, in our opinion, the most important indicators for a company nowadays.

Secondly, it is possible to perform the data-driven management of organizational processes which allows to free workers and managers from routine tasks. The system used by Ray Dalio, founder of Bridgewater Associates investment firm, is an example of such implementation (Dalio, 2018).

Thirdly, analysis of the data on all actions and results of each staff member along with assessment of his/her knowledge, skills, and competencies will allow to create the most effective talent management system in the company and maximize efficiency of staff training. All this helps to create and use a comprehensive "information monitoring system" which allows to take a fresh look at the characteristics, actions, and efficiency of an employee.

Human Resource Management is being actively developed and adopts new technologies. In the foreseeable future, some HR functions will be optimized and automatized. Generally, they are the functions connected with implementation of the operational tasks (personnel document control, payroll preparation and accounting, assessment of HR indicators, etc.). As for the strategic key functions, they will be further developed and increase their value for the

business through more balanced management decisions which will be ensured by data analysis. We suppose that these are the functions that will be developed through usage of People Data Analytics in the first place. Ideas on how they can be developed with the help of People Data Analytics are given in Table 1.

Table 1. Uses of People Data Analytics technology for Human Resource Management

Uses	Relevant functions of Human Resource Management				
	Employee engagement	Recruitment	Assessment, training, and career of personnel	Labor productivity	Personnel loyalty
Applications and services	ERP system, 1C: Salary and Personnel Management, SAP HR, Namely, Zenefits, etc.	Online recruiting services, system of references, monitoring of social media, Robot Vera, HH.ru solutions.	ERP system (development and efficiency of personnel), LMS system, iSpring Online LMS, Unicraft.	ERP system, CrocoTime, DeskTime, HandyKPI, Zoho People, Tabelly, Taltrack.	Services for online interviewing, content analysis of texts and employee behavior: AltSuite, OPROSSO survey.
Data	Motives, KPI, income, non-financial incentives, logs in systems.	Information on the jobseeker, index of compliance to the position and the company, job performance at the last place of work.	Training and its impact on job performance. Competence profile.	Labor productivity. HR metrics for each function.	Loyalty and engagement indexes in the context of factors. Logs in systems. E-mail and chat messages.
Analysis methods	Semantic services and ontology, Big Data.	Analysis of social media and digital footprint. Detection of anomalies.	Calculation of metrics, the Kirkpatrick Model, profiling of values.	Econometrics, calculation of metrics, employee value profiling.	Segmentation and clusterization, context analysis.
Goals	Increase of labor productivity taking into account the impact on employee engagement.	Recruiting employees whose set of values is optimal for the company.	Assigning best employees to optimal job positions in order to effectively achieve organizational goals.	Maximizing personnel costs efficiency in the context of the optimal ratio between the costs and labor productivity at the level of the company, department, employee.	Maximizing personnel loyalty with the current changes in mind.
Technologies		Testing of employees, analysis of the jobseeker's digital footprint.	Assessment of employee's competencies and their impact on achievement of KPI and metrics.		Interview methods, analysis of the employee's rhetoric and actions to estimate

					changes in his/her attitude to work.
Perspective uses	Fully automated system of employee engagement with the possibility of further adjustment.	Customized automatic selection of the best applicants for the specified positions.	System of recommendations for development and career progression of employees.	Comprehensive system for evaluation of the factors that affect labor productivity.	System for prediction of personnel loyalty based on the predictive parsing.

The specialist in People Data Analytics will perform the following standard tasks in the field of collection, analysis, generalization, and presentation of the people data:

- Collection of the people data from all available sources
- Integration, creation of a comprehensive description of the employee and his/her image in the future taking into account various internal and external factors
- Removal, deduplication, elimination of false data, depersonalization of the data after usage
- Storage of data analysis results in the form suitable for future use
- Evaluation of correlations between the indicators and their impact on the company's performance results
- Ensuring of optimal usage of the data analysis results for management decision-making, etc.

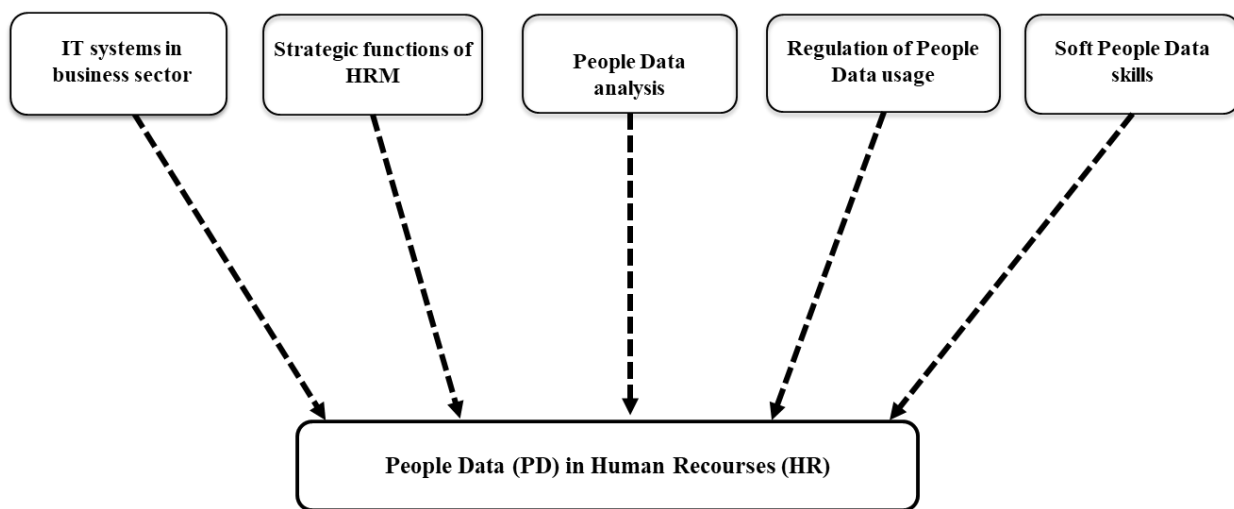
We would also like to outline the main competencies required for any professional involved in People Data Analytics. In our opinion, they should include:

- Data analysis (from the approaches to mental activity to the methods of static data processing)
- Operating skills in the software systems for data analysis (R, SPSS)
- Operating skills in the modern ERP systems
- Advanced data visualization
- Analysis of job performance
- Econometrics
- Machine learning
- Legislative regulation of the personal data usage
- Digital urban planning
- Critical and systems thinking

- Team work experience (including the Agile approach) in the frameworks of business processes development in the company using data and involving representatives of the company's key business divisions (marketing, sales, service, accounts, IT).

The specified competencies required for the professionals involved in People Data Analytics can form the basis of an educational program in Management, Business Informatics or Human Resource Management. In our case, the best option is the last one. It can be included in the educational program of the master's degree or CPE (Continuing Professional Education). The framework of such educational program can be described as follows (Figure 2).

**Fig. 2. Frameworks of the People Data Analytics educational program for the specialization in Human Resource Management**



*Source: author's work*

Analysis of the expected work characteristics of the professionals involved in People Data Analytics leads to the conclusion that they should not only freely operate IT systems organizing them according to the data used in the company, but think in the new ways. They should rely on the data on the employee's work instead of reflection of his/her work in reality.

## **Conclusion**

The presented area of research and practice ("People Data Analytics" in the field of Human Resource Management) is only at the beginning of its active development. In the future, we expect massive creation of the services designed to facilitate management activity in high-tech companies through the usage of People Data Analytics in HR, sales, and other areas of organizational activity. In order to be able to work in this field and possess the required competencies, it is necessary to create new educational programs, train specially selected people, integrate the best practices of the people data operation into organizational processes.



In our paper we described the opportunities and prospects of the People Data Analytics technology for management decision-making in the field of Human Resource Management under the existing circumstances taking into account the business needs, changes of conditions, and the entire complex of data on these conditions from external and internal sources. We believe that this approach will allow to manage employees in a more effective way and create the basis for the decisions on specific measures of the company towards each of them.

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