Priority technologies for the adoption of digitalised human resources management in hospitality industry

Maksim Romanov[*]

Sochi State University, Department of Economics and Management Processes, Chair of Administration, Accounting and Auditing, 354000 Sochi, Russian Federation

Abstract. The intensification of digital transformations in human resources management involves the creation of innovative products and service solutions that can improve the management efficiency and develop the information infrastructure. The article identifies and substantiates the priority tools and technologies for the adoption of digitalised human resource management in the hospitality industry and describes the complex of HR metrics made up by the author for the key areas of personnel processes in the hospitality businesses and including the following main metrics: HR automation, HR analytics, HR marketing, smart recruitment, and e-training. The author presents the system of indicators for the evaluation of functional units of the model of digitalised human resources management in the hospitality industry and evaluates the priority tools of digitalised human resources management in terms of the hospitality industry in Moscow, St. Petersburg and the Krasnodar region.

For the sustainable development of the hospitality industry in the current difficult conditions, an effective human resources management system is of primary importance. The high quality of services, oriented personally to each guest, is accompanied by high requirements for the staff. Many enterprises are starting to invest a part of their financial resources directly in human capital, considering it to be the most important asset in the business development, especially as specific as the hospitality industry. Only a creative person, who can easily navigate digital transformations of business processes in hospitality, can play a leading role in ensuring competitiveness, which, respectively, increases the requirements for personnel management [1].

The transition of human resources management to a digital environment results in the transformation of tasks, basic functions, and the management structure itself. It should be noted that digital transformations are required, primarily according to the types of processes in human resources management related to the development, evaluation and certification, and internal motivation.

---

[*] Corresponding author: arutunyan1109@mail.ru

To understand the essence of the definitions "digital technologies in personnel management", "digitalisation" and "digital transformation", it seems important to consider the typology of these concepts.

Digital transformation is generally a set of transformations in human resources management, including a change in the structure of management based on digital technologies. The digital transformation in human resources management, in most cases, is accompanied by the development of a digital platform, supported, as a rule, by a service integrator that provides the interaction with digital technologies.

Digital technologies are the technologies used in a digital format to optimise the personnel activities in the area of human resources planning and recruitment, their use, development, evaluation and motivation.

Digital technologies in the field of human resources management are mainly based on such a human resources management tool as "Personnel-digitalisation" which the author understands as a mechanism and methods of interaction of personnel with digital technologies.

In its turn, the formation of "Personnel-digitalisation" is grounded on a competency-based method implying that employees have a certain level of knowledge and competencies to perform the tasks of digital transformation of personnel management processes. It means that a competency-based method is considered to be a system of analytical evaluation enabling to find out the compliance of personnel potential with the goals of the company development in the context of digital transformation depending on the priority of certain areas and technologies of digitalised human resources management.

The intensification of digital transformation forms the need to create high-quality and innovative products and service solutions that will be competitive in the domestic market. In this regard, the focus should be directed on the elaboration of effective levers and technologies in the development of digitalised management which can not both increase the management effectiveness and also create an information infrastructure [2].

In these conditions, the task arises to identify the priority tools and technologies for the implementation of digitalised management. This process should be aimed at improving the personnel management system and, first of all, by means of human resources [3].

Based on the analysis of the publications of Russian and foreign researchers on the evaluation of personnel management efficiency, the author has formed a set of HR metrics in the key areas of personnel processes in hospitality industry businesses [1]. The basic requirements for the formation of metrics were the following:

− each selected metric is important and necessary in matters of personnel evaluation;
− the system should assess in a certain way the effectiveness of the personnel management functions;
− the influence of metrics on the improvement of personnel management processes should be taken into account;
− the relationship of metric parameters with the main business processes of the hospitality industry.

The structure of digitalised human resource management allows the author to identify its main metrics: HR automation, HR analytics, HR marketing, smart recruitment and e-training. These areas of personnel management in the hospitality industry provide a possibility to evaluate the structure of digitalised management by the types of activities, including the demand for staff, certification and training, evaluation and motivation, and a number of other areas which is determined by the high requirements for providing the services to the guests visiting the tourist centres. As for such metrics as smart recruitment or selection, selection and hiring of staff for hotel businesses, the metrics assume high responsibility for the results since the work in the field of contact with guests is grounded on professional competencies and high standards of service.

The rationality to apply these technologies in the hospitality industry can be carried out by considering each technology in the form of an analytical unit, followed by the development and testing of a system of index indicators for evaluating HR indicators.

The purpose of creating index indicators is the formation of information and analytical mechanisms that have found practical application in the development and adjustment of management influences on the creation and development of human resources of organisations in the hospitality industry.

At this stage, the main objectives of the author were to form the system of indicators and work out the methodology for calculating index indicators, collecting data and testing the methodology for calculating them, as well as a preliminary evaluation of the level of digitalisation of hospitality industry personnel management.

The evaluation of analytical units of digitalised management of human resources in the hospitality industry can be implemented by calculating individual indicators [4]. The obtained evaluation data make it possible to derive the functional dependence of the proposed indicators. It is more expedient to bring these indicators to a general form and use by means of the criteria convolution method, i. e., the reduction of a set of criteria into one based on the use of weight coefficients for each criterion (Table 1).

Table 1. System of the indicators for the evaluation of functional units of the model of digitalised human resources management in the hospitality industry.

	Indicator
HR automation	1.1 Broadband Internet access
	1.2 Electronic data interchange in information systems
	1.3 Application of software and hardware preventing the unauthorised access of malicious software
	1.4 Digitalisation of electronic signature
	1.5 Software for analysis and control of computer system security
Smart recruitment	2.1 Application of software package in solving the most important tasks of organisation, business process administration, and financial activity
	2.2 Mobile devices and gadgets provided to employees
	2.3 Social networking web-sites for professional training and internal or outsourced staff recruitment
	2.4 Application of global networks and software for encouraging and motivation of employees
HR marketing	3.1 Web-site
	3.2 Application of the Internet in the organisations for information search
	3.3 Application of cloud services
E-training	4.1 Costs for staff training dealing with the development and implementation of information and communication technology per an organisation of hospitality industry
	4.2 Payment for the outsource services in information and communication technology per an organisation of hospitality industry
	4.3 Share of the employees having basic skills in digital technology

Table 2. Normalised values of indicators for the evaluation of analytical units of digitalised human resources management in the hospitality industry.

No	Indicator	Normalised values		
		2017	**2018**	**2019**
HR automation				
	Digital infrastructure			
1.1	Broadband Internet access	0.95	0.99	1.00
1.2	Electronic data interchange in information systems	0.32	0.71	1.00
	Information security			
1.3	Application of software and hardware preventing the unauthorised access of malicious software	0.87	0.97	1.00
1.4	Digitalisation of electronic signature by the implementation of special means	1.00	0.97	0.95
1.5	Software for the automation of analysis and control processes of computer system security	0.95	1.00	1.00
Smart recruitment				
2.1	Application of software package in solving the most important tasks of organisation, business process administration, and financial activity	1.00	0.96	0.94
2.2	Mobile devices and gadgets provided to employees	0.84	0.98	1.00
2.3	Social networking web-sites for professional training and internal or outsourced staff recruitment	0.92	0.91	1.00
2.4	Application of global networks and software for encouraging and motivation of employees	0.89	0.92	1.00
HR marketing				
3.1	Web-site	0.87	0.91	1.00
3.2	Application of the Internet in the organisations for information search	0.95	0.96	1.00
3.3	Application of cloud services	0.85	0.71	1.00
E-training				
4.1	Costs for staff training dealing with the development and implementation of information and communication technology per an organisation of hospitality industry	0.73	0.71	1.00
4.2	Payment for the outsource services in information and communication technology per an organisation of hospitality industry	1.00	0.73	0.68
4.3	Share of the employees having basic skills in digital technology	0.88	0.95	1.00

The generated indicators for each group have a hierarchical orientation, i. e., by reference to their importance in the evaluation system, the matrices of pairwise comparisons are built for analytical units of digitalised human resources management in the hospitality industry: HR automation, smart recruiting, HR marketing, e-training.

For each matrix, the maximum eigenvalue (MEV_{max}) and eigenvectors are calculated which reflect the priority level of the compared elements of the matrix.

After calculating the eigenvector of the matrix, it is necessary to determine the matrix consistency index (MCI) which provides the information on the degree of consistency of the indicator evaluations:

$MCI = (MEV_{max}-n)/(n-1)$,

where *n* is the order of matrix.

Then, the author evaluated the analytical units of digitalised management of the personnel potential of the hospitality industry, taking into account their priority.

The initial considered indicators were taken from the materials of the State Statistics Committee of the Russian Federation and the statistical collected books of the national research university "Higher School of Economics".

Using the initial data, the normalised values of the indicators for evaluating the analytical units of digitalised human resources management in the hospitality industry were calculated by correlating each of the values to the maximum level (Table 2).

The algorithm for evaluating the influence degree of the indicators within the limits of each criterion involves the compilation of matrices of pairwise comparisons and the determination of priority vectors.

The study showed that the indicator of the relative consistency of comparisons did not exceed 10% for each of the criteria which proves the correctness of the indicators used in evaluating the analytical units of digitalised management of the personnel potential in the hospitality industry.

Further, the author used the normalised values of the indicators and rated the indicators of analytical units separately and the general indicator of digitalised human resources management of the hospitality industry taking into account their priority (Table 3).

Table 3. Dynamics of consolidated indicators of analytic units of digitalised human resources management in the hospitality industry with regard to their priority.

Indicator	2017	2018	2019
$K_{HR\ automation}$	0.838	0.937	0.989
$K_{smart\ recruitment}$	0.901	0.942	0.991
$K_{HR\ marketing}$	0.894	0.851	1.000
$K_{e\text{-}training}$	0.869	0.816	0.911
K_{HR}	0.874	0.875	0.963

The above presented tables feature that the digitalisation of human resources management in the hospitality industry is largely determined by the e-training indicator (36% of 100%), as well as HR automation (22% of 100%) and HR marketing (22% of 100%).

In fact, the implementation of an e-training tool can significantly reduce the time an employee starts working

The obtained results of HR automation and HR marketing priority assessment of 22% are also confirmed by the practical application of integrated technologies of personnel management and formation of corporate culture and personnel prestige of company.

Next step was to assess the selected digitalised personnel management tools in terms of the hospitality industry in Moscow, St. Petersburg and the Krasnodar region (Fig. 1).
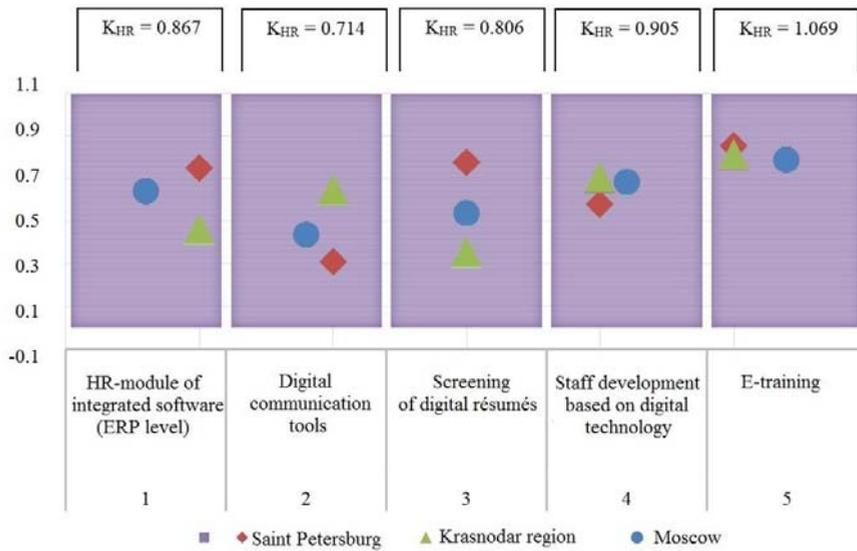
Fig. 1. Priority technologies for adopting the digitalised human resources management.

The findings show that e-training is the top priority tool for the hospitality industry against the background of the widespread introduction of HR modules of integrated software (Table 4). The author suggests that the most promising tool is the interaction of the subjects of personnel management in the hospitality industry as a part of a universal digital platform where the required competencies of employees to fulfil the tasks are analysed and developed. The software technologies and digital tools designed and maintained by a service integrator, i.e. organisational structure of platform control, can act as a digital platform. Nevertheless, many experts currently note that the digitalisation of some types of activity can serve not to reduce but to increase social inequality [5]. That is why it is necessary to conduct an appropriate policy in the field of education in advance, to develop comprehensive programmes for retraining personnel and continuous training.

Table 4. Evaluation of the tools of digitalised human resources management in terms of the hospitality industry in Moscow, St. Petersburg and Krasnodar region.

	Name	Moscow	St. Petersburg	Krasnodar region	K_{HR}
1	HR-modules of integrated software, digital platforms	0.641	0.749	0.462	0.867
2	Digital communication tools	0.436	0.305	0.650	0.714
3	Screening of digital résumés	0.537	0.776	0.354	0.806
4	Staff development based on digital technology	0.683	0.578	0.705	0.905
5	E-training	0.789	0.852	0.814	1.069

In St. Petersburg, e-training and the implementation of HR-modules of integrated software systems (digital platforms) occupy leading positions, but digital screening of resumes plays an important role at the same time due to the large number of candidates for a vacant position (4 people/place).

In the Krasnodar region, the tools for personnel development are given an important place - electronic training and development of employees based on digital technologies, but digital communication tools are of major importance too which is explained by the large number of small businesses in the hospitality industry and informing the potential customers via messengers and social networking web-sites is less costly resources for them.

The study results reveal that the implementation of digitalised management in the hospitality industry as a direction for improving the personnel management enables to increase the effectiveness of the human resources formation, corporate culture, prestige and stability of personnel which leads to a significant growth in the complex HR impulse of the hospitality industry as a whole. Consequently, the digitalisation in human resources management can be defined as the most important tool for the management enhancement in any organisation.

References

1. V. A. Boroday, *High technology and modernisation of economy: achievements and new vectors of development* (I International scientific and practical conference, 78-85, 2017)
2. O. Yu. Bestuzheva, O. N. Vershinskaya, Energy Policy, **5**, 49-57 (2017)
3. A. Ya. Kibanov, V. G. Konovalova, M. V. Ushakova, *Personnel Management Service* (Knorus, Moscow, 2010)
4. D. V. Kruglov, Labour Economics, **4/5,** 951-958 (2018)
5. E. P. Kostenko, State and Municipal Administration. Scientific Notes, **2**, 58-69 (2020)