Digital tools for HR management in agriculture: challenges and opportunities

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Abstract. The article examines the main trends in the use of information and communication technologies in the context of managing the human resources of agricultural enterprises. It has been established that the innovative development of the country's agro-industrial complex depends on the speed of updating technical, technological and information knowledge, as well as the level of development of the dynamic abilities of specialists and workers in the agricultural sector. Information technologies used in agricultural production in the process of labor resource management, marketing activities, and production are considered. The need to conduct systematic research on the development of digital transformation of agricultural enterprises with an economic justification for the feasibility of introducing digitalization in HR management is pointed out. It is concluded that information support for managing the human resources potential of agro-industrial enterprises should be based on the latest knowledge and implemented in business and HR management processes.

1 Introduction

The priority area of functioning of enterprises of the agro-industrial complex in modern economic conditions is becoming information support for managing the development of human resources potential of enterprises. With the rapid development of scientific and technological progress, the need of agricultural enterprises for modern scientific developments on the digitalization of production management is increasingly increasing, especially in modern economic conditions.

The relevance of the study is due to the growing interest of agricultural enterprises in introducing the latest technologies in the field of agricultural production, which will increase productivity and will have a powerful positive effect on further development. At the same time, the main goal of increasing the efficiency of human resource management of agricultural enterprises should be to provide enterprises with such labor resources that are capable of solving complex problems using the latest computer technologies, which will contribute to the rapid and high-quality achievement of operational and strategic goals. Considering the speed of changes in the technological development of the country's agro-

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industrial complex and the popularization of scientific and technical developments among agro-industrial enterprises, the introduction of innovative information technologies in the HR management system based on the optimization of business and HR processes of agro-industrial enterprises is of particular relevance, which is discussed in the article.

2 Research Methodology

Research on the formation of human resources potential of agro-industrial complex enterprises and the identification of features of the use of information technologies in the process of managing business and HR processes in the agricultural sector was carried out by numerous scientists [1-8, etc.]. At the same time, further development requires issues of information support for the process of managing the human resources of agricultural enterprises, which provides the opportunity to make complex management decisions that help optimize costs, maximize profits and increase the competitiveness of agricultural production. Taking this into account, there is a need to conduct more in-depth research on the formation and development of the human resources potential of agricultural enterprises in the context of digitalization.

The purpose of the article is to determine the main directions of use of information systems and technologies in the context of managing the human resources of agricultural enterprises in modern conditions.

In preparing this article, general scientific methods of comparative, systemic, structural-functional, economic and statistical analysis were used. The methodological basis was scientific works on theoretical and applied aspects of the development of the digital economy and information support for the process of managing the human resources of agricultural enterprises.

3 Results and Discussions

Given the massive digitalization of the economy, the problem of choosing the optimal software for the successful functioning of agricultural enterprises is becoming increasingly urgent. In particular, there is competition in relation to computer programs used in the field of personnel management. From an economic point of view, it is information technologies that make it possible to turn information into a resource and source of added value and employment. The introduction of digital technologies is increasingly accelerating, which requires consumers to have certain competences, especially in the context of creating human capital that makes up the digital economy. In crisis conditions of managing agricultural enterprises, information support for the management process contributes to achieving competitive advantages, increasing labor efficiency, as well as maximum labor productivity of personnel [4; 6].

In particular, information support for human resources management consists of the development and implementation of management decisions based on the analysis of the information array on workforce planning and personnel selection, the methodological basis for labor standardization, regulation of job responsibilities, labor protection, technical and economic data related to ensuring the effective use of working hours and the formation of a motivational management system [6].

At the same time, work [3] argues that the role of digital technologies in crisis conditions of agribusiness is manifested through an increase in labor productivity, expansion of methods of marketing agricultural products, as well as an increase in the level of consolidation of agricultural enterprises with companies developing specialized information technologies.

Leading agricultural enterprises involved in the crop and livestock sectors are actively searching for and implementing high-quality innovative solutions that can increase the efficiency and productivity of their own production and economic activities. Each agricultural enterprise has its own specifics and needs individual innovative information solutions. In particular, digitalization is used to change the business model, which provides the generation of additional revenues and opportunities to create new types of value chains. Modern enterprises are increasingly trying to integrate the latest technologies into operational processes and continue to actively expand digital means of production. It was the quarantine measures introduced due to the spread of coronavirus that became a powerful impetus for agricultural enterprises to make decisions to attract digital services to manage business and HR processes.

Receiving potential benefits from digitalization of the agricultural sector requires significant transformation in production, marketing, logistics and HR processes. Taking this into account, changes are expected in the economics of the agro-industrial complex, social infrastructure, public life, as well as in the management of natural resources [6].

With the introduction of digitalization at agricultural enterprises, much more attention should be paid to improving the qualifications of workers, systematically updating skills and abilities, in particular, in computer technology. This is to a greater extent possible due to the stimulation and assessment of the contributions of such specialists to the result, which will contribute to the achievement of the long-term goals of the enterprise and ensure an increase in its competitiveness. It should be noted that in the context of digitalization of the agro-industrial complex, new directions for solving employment problems are emerging; the workplace ceases to be a physical object. Thus, an agronomist in a “digital workplace” has the opportunity to work remotely with a flexible work schedule, which optimizes the cost of equipment and maintenance of office space. Thanks to mobility, workers can not be in the field during the entire working day, but work from any geographical location where there is access to an Internet connection.

Let us note that today the priority values of personnel working with IT include such items as comfort in the workplace; consistency in tasks; lack of monotonous work; intuitive interfaces and technologies.

Consequently, digital services for personnel management of agricultural enterprises should include specialized modules based on mathematical models. For example, certain modules can support solving problems of high-quality personnel selection based on simulation modeling, etc. There are software products aimed at automating accounting, production and management processes.

According to some scientists and specialists [1-8], modules of digital services should contain the following functions related to the assessment of the sociological and psychological characteristics of the employee’s personality, which is quite important for the work of personnel services; in most HR management information systems they remain completely unprocessed volume. Typical tasks of information technologies used in personnel management are personal accounting of employees, statistical and operational accounting and reporting, analysis of personnel movement, analysis of the qualitative composition of personnel, and archiving.

The choice of a specific information system module provides greater opportunities for the development of agricultural enterprises. The functionality of information systems for HR management allows you to effectively carry out personnel planning, hiring, adaptation, certification, formation of a personnel reserve, training, motivation; increases the activity of department heads in human resources management; allows you to evaluate the effectiveness of not only the work of the personnel service, but also the enterprise as a whole.

It has been established that the personnel management of small agribusiness, in particular farms, in matters of using IT, prioritizes the selection and accounting of personnel. For

medium and large businesses, the importance of personnel development and the need to form a personnel reserve are increasing. Taking into account differences in the scale of activity, indicators such as the number of jobs, the division of functions of users of digital services with HR management, the speed of its functioning, the complexity of administration, the cost of the service, the coordination of mechanisms ensuring access rights are used [5; 7].

Scientists note that the HR management system at enterprises, depending on the size and capacity of production, provides for the presence of a coordination link: a personnel management service and a responsible person - a personnel manager. The development of goals, functions, methods, HR policy plans and technologies for implementing planned activities, ICT, criteria and methods for assessing the performance of both personnel and implemented digital technologies should be aimed at achieving efficiency in terms of the results (income) of the enterprise [4].

The strategic task of managers in the process of digital transformation of agricultural enterprises is to create a set of integrated partnership measures with IT companies, research and educational organizations in order to disseminate the best IT in the agricultural sector: Internet of Things, robotic operations, artificial intelligence, Big Data , global navigation satellite system (GNSS , the most common are GPS and GLONASS), unmanned aerial vehicles, geographic information services, intelligent biosensors and high-tech sensors, 3D printing technologies , urban organic crop production, etc. Almost every agricultural enterprise is already using technologies with low impact on the production value chain, namely: broadband Internet networks (cloud computing, remote sensing, tablets, etc.); e-business platforms (marketplace); ICT; agricultural mobile applications; mobile messengers; agricultural forums and agricultural online applications aimed at increasing the efficiency of information received and the professional awareness of agricultural enterprises.

It has been established that in the practice of agricultural enterprises, in addition to a team of specialists who use IT technologies, for example, agronomists, biotechnologists, marketers, engineers, logisticians, in order to optimize costs, virtual divisions are increasingly being created, a transition is being made to outsourcing, digital agricultural consulting, etc. n. At the same time, employees must meet certain requirements, have specific intellectual abilities, the ability to work in a team, have self-education skills, and a desire to improve their skills. Let us note that active participation in such structures belongs to HR managers, which indicates the advisability of integrating the areas of personnel management with production. Artificial intelligence will optimize processes, eliminate unnecessary communications, create a comfortable working environment, and relieve managers from performing routine tasks. Managers will still have the function of monitoring algorithms, making decisions, adjusting business and HR processes [5]. Taking into account the strategy of activity of agricultural enterprises specified during reengineering, it is necessary to introduce innovative technologies into the HR management system based on the optimization of its processes and functional operations. It should be noted that cognitive technologies used in HR management are based on the use of artificial intelligence and digital data and allow the following decisions to be made: digital training and research based on game brainstorming; smart office management (built-in voice systems); gamification of curriculum content, in particular online learning; digital survey (real-time big data analytics, HR process administration); integrated analytics tools for personnel selection, use of partner attraction programs [2].

The creation of an information support system for enterprises should be based on computerization, training and advanced training of workers, the creation of a system base, and in the future, the formation of a unified information space of the agro-industrial complex [7]. Therefore, the qualitative characteristics and professional competencies of workers must be formed, for example, through technology transfer, which is the movement of knowledge or technology from one organization to another, or from educational organizations, research

institutions to agribusiness, where knowledge is transformed into an innovative product. Taking into account the above, technology transfer will provide an opportunity to optimally direct agricultural innovations, which determine and take into account the rate of change in the technological development of the agro-industrial complex, and also form potentially important areas of scientific research and development. It should be noted that the development of scientific and technical progress and innovations in the agro-industrial complex contributes to a more efficient use of labor and capital investments, which ultimately leads to economic growth not only of an individual enterprise, but also of the industry as a whole.

Therefore, in order to achieve high quality human resources in agribusiness, as well as to stop the outflow of IT specialists, it is first necessary to ensure favorable working conditions. In addition to the state, large and medium-sized enterprises are also able to accomplish this, which in this way will be able to improve their staffing and create the personnel potential they need, trying to adapt as much as possible to the IT challenges of the present. Today, there are already certain trends in the digitalization of agricultural enterprises and trends in scientific and technological progress in production. But, if we talk about the potential for financing the development or purchase and subsequent implementation of digital technologies, then in Russia the agro-industrial complex is doing much better than in a number of other sectors of the economy. In the domestic top 25 agro-industrial complex, the annual revenue of each company exceeds 50 billion rubles, of which 13 enterprises have revenue of more than 100 billion rubles, and three have more than 200 billion rubles. For comparison: in the top 25 pharmaceutical companies in Russia, only one has annual revenue of 120 billion rubles, and each of the others has less than 35 billion rubles [5; 6]. This means that in our country there are financial opportunities for introducing digital solutions in the agro-industrial complex, and there are more of them than in the pharmaceutical industry.

It should be noted that at the transition stage, the existing digital arrays of agricultural enterprises need to be supplemented with data received in paper form, however, over time, the paper load will decrease, which will have a positive impact on the management of business and HR processes and will lead to effective functioning in the market. With this in mind, the digitalization of agribusiness is aimed at making it more transparent by entering detailed information (on the number of personnel, production status, etc.) into a digital database that can be controlled by managers at all levels, which will be accompanied by minimal costs time, effort and resources.

At the same time, it is necessary to analyze certain factors that influence the possibility and speed of implementation of digital technologies, namely: the skills of working with technical devices of the digital network depend primarily on the computer literacy of workers; financial support for the implemented digital technology through the acquisition of the necessary equipment for the efficient operation of agricultural enterprises; readiness for the changes that will come with the introduction of new technologies into the work of agricultural enterprises.

Despite the rapid growth of enterprises' interest in digital technologies, workers still lack the knowledge to master the latest online resources and computer technologies. According to the authors, this problem is systemic in nature and requires a solution at the state level through the introduction of digital literacy training programs. Managers of agricultural enterprises should be personally interested in facilitating the acquisition of specialized knowledge by workers, involving them in learning through online courses, master classes, etc.

So, the main directions for improving the quality of information support for managing the personnel potential of agricultural enterprises are: combining economic and personnel information; prompt changes to information files; providing employees with transparent information regarding possible remuneration, career growth and other information when hiring; significant expansion of the necessary information for further analysis and decision-

making; simplification of the office work system through the introduction of electronic document management, etc.

Consequently, IT challenges today require the use of digital technologies in enterprises, which is due to the improvement of the communication process between enterprises, consumers and suppliers, improvement of the quality parameters of products, which will ultimately lead to a reduction in the migration of young people from rural areas, a reduction in costs and resources and will contribute to optimization of business process management of agricultural enterprises. With the proper implementation of digital technologies in the work of agricultural enterprises, business reputation will significantly increase, competitive advantages and the level of consumer satisfaction will be ensured. "Proper implementation" means not only updating the resource base or purchasing software for working with a digital data array, but also restructuring management activities, internal and external relations, internal corporate structure, etc.

4 Conclusion

The institutional environment for the functioning of personnel management of agricultural enterprises is actively changing along with the expansion of their activities, which can be effectively carried out with the involvement of electronic networks, further integration of human resources into the enterprise management system, increased attention to the process of organizing the work of personnel and is characterized by improved approaches to organizing the network principle of interaction between participants communication process. In the context of using local and global computer networks to manage business processes, the introduction of digital technologies is becoming widespread. At the same time, stakeholders increasingly demand relevant digital multi-dimensional representation of information, which encourages managers to improve their digital skills. Thus, the use of digital technologies in the HR management system of agricultural enterprises is aimed at optimizing all business processes, which will ultimately help reduce costs, prevent risks and increase the efficiency of using human resources.

Acknowledgments

The article was prepared within the framework of the Russian Science Foundation project "Methods and models for increasing the innovative potential of human capital in the contours of a new stage of civilizational development: macro-regional aspect" 24-28-01644 (director F.A. Mambetova)

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