

# DEVELOPMENT TRENDS IN HUMAN RESOURCE MANAGEMENT OF AGRICULTURAL ENTERPRISES IN THE CONTEXT OF DIGITALISATION

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**Abstract.** The *subject* of the study is the development of personnel management of agricultural enterprises in the context of digitalisation. *Methodology.* The study uses general scientific methods, in particular, theoretical generalisation, methods of analysis and synthesis, statistical analysis, as well as graphical methods to visualise the results of the study. The *aim* is to study the main trends in the development of personnel management of agricultural enterprises in the context of digitalisation. *Results.* The main trends in the digitalisation of HR management in agricultural enterprises indicate the widespread use of modern digital technologies to optimise and improve the efficiency of HR management in agriculture. One of the key trends is the use of digital tools in recruitment and selection, including websites and online platforms for job search, social media for attracting candidates, automated candidate management systems and analytical tools for assessing candidates. Digitalisation allows agricultural enterprises to respond more efficiently and quickly to staffing needs, attract and retain talented employees, and increase the overall productivity and competitiveness of the industry. Such technological changes are becoming a key element of agricultural business development in the current environment and play a significant role in ensuring its success and sustainability in the future. The main trends in the digitalisation of HR management in agricultural enterprises include several key aspects aimed at using modern digital technologies to optimise HR management and increase efficiency. First, digital tools such as online platforms, websites and social media are used in recruitment and selection to attract and select candidates for vacant positions. The second trend is the automation of administrative HR processes. Digital systems can automate time tracking, payroll, leave calculation and other aspects of HR management, freeing up managers' time for more strategic tasks. The third trend is the development of online learning and electronic platforms for staff development. The use of digital tools for training and development of employees allows them to improve their skills and adapt them to changes in the industry. The fourth trend is the use of analytics to make management decisions. HR data analysis allows managers to obtain objective information about the productivity and needs of their staff, which helps them make informed management decisions. In addition, the development of flexible working arrangements and remote work is another important trend. Digital technologies provide the ability to work from anywhere, which helps to attract and retain talent regardless of where they live.

**Keywords:** human resources management, personnel management, agricultural enterprises, digitalisation, digitisation.

**JEL Classification:** M12

## 1. Introduction

The development of the digital economy is a major global economic process that is being driven by the Fourth Industrial Revolution. This complex and multifaceted process has both significant opportunities

and serious risks and has a significant impact on the overall economic dynamics and structural changes in various sectors of the world economy, as well as on the economic and investment development of Ukraine. World experience in the development of the digital

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economy sector shows that the state is a key initiator of the implementation of digitalisation processes due to their systematic and global nature, which provides for their integration not only into economic spheres, but also into public life. The digital transformation of the economy takes place simultaneously at the macro and micro levels. It is essential to create a digital environment for the national economy that meets the needs of the state and state institutions, citizens and businesses. This issue is highly relevant as it reveals the international competitiveness of Ukraine's digital economy, which is strategically and economically crucial for European integration.

Ukraine, which has significant agricultural potential due to black soil on 65% of its territory, is most profitable thanks to the grain sector. As this sector has its specificities, it is important to understand that the digital transformation process in the agro-industry will have its own characteristics. The digital transformation of agriculture is considered one of the essential tools for diversifying the national economy and reorienting it from the model of exporting raw materials to the supply of high value-added products. The main task of digitalisation in agriculture is to reduce the costs of agricultural production and improve its quality and competitiveness through the efficient use of resources and science-based approaches.

The transition of farms to e-agriculture can involve the use of advanced digital technologies. These technologies include computers, servers and websites that enable the exchange of information about farming and agricultural markets, as well as advice and other valuable data. This also includes mobile devices that help to quickly find information, get advice and access banking services. Satellites provide up-to-the-minute weather data and the GPS global positioning system. Telephones and communications create an interactive voice communication system. Telecommunication technologies enable the transfer and exchange of experience, advice and communications, and promote community development and cooperation. Sensor networks provide real-time data and improve decision-making. Cloud storage and analytics technologies enable the use of precision farming systems and practical solutions. The Internet and broadband access facilitate knowledge sharing, e-commerce, social media, banking and the development of trading platforms.

The introduction of information technology and digitalisation of human resources management is an important aspect of the development of agricultural enterprises. This makes it possible to assess the degree of modernity of management practices and measures taken at the enterprise. For this reason, ensuring a high level of digital transformation of the enterprise

in the labour market is crucial for creating a modern HR management system.

## 2. General Trends in the Digitalisation of the Labour Market in the World

Entering the digital age marks a new phase in the development of technology and an impact on the entire socio-political reality. Although there are no universally accepted and agreed definitions and legal frameworks for this concept, digital technologies are already rapidly shaping the future. By focusing solely on their technical capabilities, society can embark on an innovative path of economic development and set priorities for scientific and technological progress. This will be based on the advanced development of basic sciences and scientific and educational activities.

Digitalisation is becoming a critical factor in the economic growth of every country. This modern development trend contributes to the gradual improvement of all business processes and related social areas through the fast and secure exchange of information. Experts identify eight critical segments of the digital economy, including government and society, marketing and advertising, finance and commerce, infrastructure and communications, media and entertainment, cybersecurity, education and human resources, and start-ups and investment.

Over the next decade, about 70% of the value created during this period will depend on digital products. While in 2018, the global GDP generated by digital enterprises was 13.5 trillion USD, by 2023 this figure had risen to 53.3 trillion USD, almost four times higher than the initial figure. This is more than half of the nominal world GDP (Krup'ianyk, 2023) (Figure 1).

As for Ukrainian realities, the results of a nationwide survey conducted by the Kyiv International Institute of Sociology (KIIS) in cooperation with the Ministry of Digital Transformation of Ukraine showed that in 2023 the number of Internet users increased by 8%, which now accounts for 80% of the population. Over the past year, the number of Ukrainians who use the internet every day has increased from 72% to 80%. Since 2021, this figure has increased by more than 10%. Overall, only 9% of Ukrainians do not use the internet, and this percentage has decreased by 5% over the past two years.

The transition to a digital economy is transforming the world of work. Advances in information technology, artificial intelligence, robotics and production automation are creating new working conditions that are significantly changing social and labour relations. An analysis of statistics on the development of ICT and the digitalisation of the economy in Ukraine shows the active dynamics of these processes in the country. It is difficult to agree

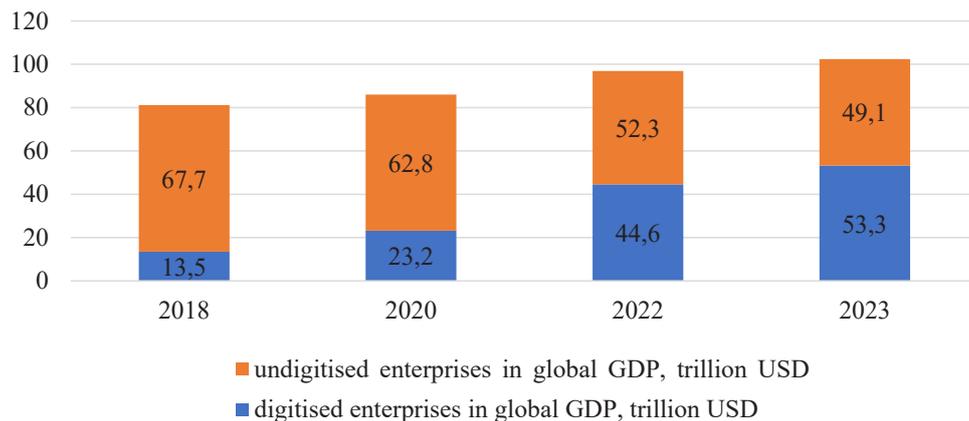


Figure 1. Digitised enterprises in global GDP (Krup'ianyk, 2023)

with the claim that the impact of technology and automation on the workforce can be predicted. The process is complex, as it involves the introduction of groundbreaking technologies and the way people use them.

The report of the Global Commission on the Future of Work, presented at the International Labour Organisation's 2019 anniversary session, highlights that the development of technologies such as artificial intelligence, automation and robotics will create new jobs. However, people who lose their jobs during this transition period may need to be better prepared to take advantage of new opportunities. The skills that are needed now may not meet the needs of future jobs, and the skills acquired may quickly become obsolete (International Labour Office, 2021).

Digital transformation is transforming existing jobs, requiring employees to have new skills to perform new tasks. This means continuous professional development, the acquisition of new knowledge over a lifetime, and the use of new software and technological processes. Such changes require rapid reskilling or replacement of employees with the appropriate knowledge and skills.

Digitalisation is creating new high-tech jobs, while other jobs are becoming redundant and being cut back. This dynamic is not new and is characteristic of every scientific and technological revolution. There are many examples of how new technologies, such as the internal combustion engine and electricity, have affected the labour market (taxi and urban transport drivers have replaced taxi drivers). In the past, technological progress first reduced the demand for labour and then led to the creation of new jobs.

The main question is whether the new scientific and technological revolution associated with Economy 4.0 will have similar consequences. Some studies analyse the process of job creation and destruction due to the digitalisation of traditional

companies and industries. The results of these studies vary considerably and depend on the methodology used and the country studied (Degryse, 2016; Dosen, 2018; de Groen et al., 2017).

The availability of the Internet and specialised web services has significantly increased the amount of information about jobs, vacancies and employees. Web services and networks contribute to increased information transparency, which means that information on the Internet is more accessible and understandable. For example, publicly accessible online employment portals in Ukraine contain information about vacancies and CVs of candidates, for example, Robota.ua has 97180 vacancies, and Work.ua has 91652 vacancies.

Another prominent influential aspect of the digital transformation of the labour market is the change in occupational orientations – completely new types of work are emerging, and therefore new jobs and vacancies. At the same time, the role of traditional occupations is declining, leading to the obsolescence of many common occupations. Young workers are now in a better position than those with work experience (experience is becoming less important). Such changes require an adequate response from the educational services market – recognition of new occupations and qualifications, registration and certification of non-formal education and anticipation of future skills.

Another manifestation of the digital transformation of the labour market is the trend towards its polarisation – the distribution of jobs according to the conditions of employment (permanent or temporary, remote) and the level of remuneration (high paid in the IT sector, low paid in traditional sectors of the economy). The emergence and growth of alternative forms of employment is becoming an integral part of such a labour market. According to experts, under such conditions, flexibility in hiring and outsourcing can lead to lower employment rates

and increased risks for individuals, so much research is devoted to analysing the precarious nature of alternative jobs. However, even if many workers are forced to work under alternative forms of employment, a significant proportion of them are satisfied with such conditions. It should also be noted that digital transformation is breaking down national barriers in the labour market and creating opportunities for remote work. The proliferation of online job exchanges and online job platforms is changing the recruitment and job search processes in all countries.

The main trends in human resource management include the following (Figure 2).

The digital transformation of the economy, which has become an indispensable part of modern development, is significantly changing national labour markets. Under these conditions, significant changes are taking place at the level of individual companies, requiring HR departments to master new HR functions, use new HR analysis tools and expand the use of software and information tools for data processing. Being aware of these trends will allow for effective adaptation to the digital world and high productivity.

### 3. The Role of Digitalisation in the Development of Agricultural Enterprise Management

The digital transformation of human resources management represents significant changes that affect

the organisational structure and management of human resources. Modern concepts of digital transformation of HRM focus on the role of a person in digital processes in the field of HRM. For example, in their research, G. V. Beyi and G. V. Sereda focus on the importance of the human factor in the digital transformation of HR management, such as the increased use of integrated mobile applications and automation of HR management processes, digital integration with cloud services, the use of predictive HR analytics, augmented reality and artificial intelligence. Implementing these innovations requires corresponding changes in the skills of HR managers. The division of responsibilities between humans and artificial intelligence is a central issue in the transformation of HR management (Beyi, Sereda, 2019). According to J. Bersin, artificial intelligence does not replace a human being, but should be used only in those HR processes that cannot be effectively performed by a human being (Bersin, 2021). The prospects of digital transformation have been explored by the authors of publications that note the need for such transformations in all spheres of social life (Kramarenko, 2022; Irtyshcheva, 2022).

The methodological bases of personnel management are presented in several classical works, and modern trends are presented in such works. Reflective aspects of personnel development management in enterprises are revealed in the research of (Bezghin et al., 2021). Aspects of personnel management in international enterprises are presented in (Ptashchenko et al., 2022). The theoretical approach to the

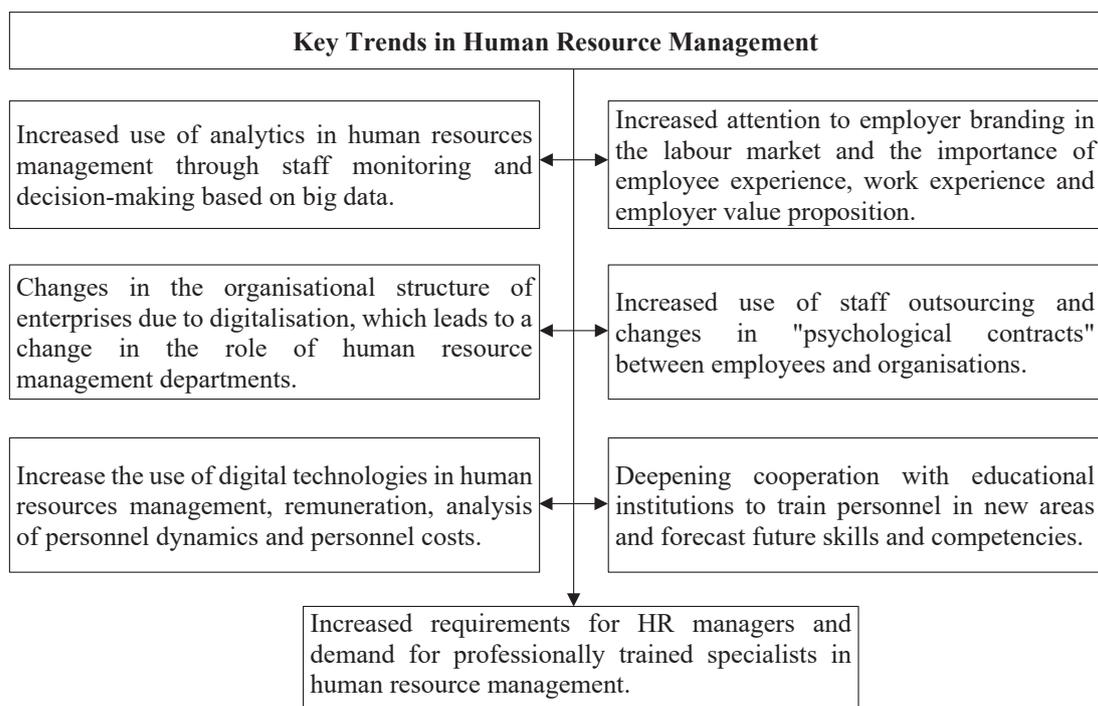


Figure 2. Key trends in human resources management

management of production resources is developed on the basis of the financial motivation of personnel proposed by (Gaponenko et al., 2021).

Studies of the transformation of HR competencies and software should be distinguished and linked to the analysis of the structural, functional and digital transformation of HR management and its impact on these processes. The main principles and methodological approaches that can form the basis of such studies were identified as follows: Bissola R. and Imperatori B. have developed a conceptual framework for studying the impact of Industry 4.0 on managerial human resources and the digital transformation of human resource management (Bissola and Imperatori, 2018; Shyfrina et al., 2019); Bondarouk T. and Fisher S. summarised the main areas of electronic HR management, key concepts and leading HR technologies (Bondarouk, Fisher, 2020); Earley S. and Davenport T. highlighted trends in the use of AI in HR management processes such as recruitment, training, staff development, personalised e-learning and management process support (Earley, Davenport, 2020; Stepanenko, et al., 2023); Kennedy E. explored the changes that virtual reality brings to the work of an HR manager and identified opportunities for its use in training and recruitment (Kennedy, 2019); Manuti A., de Palma P. D., developed proposals for the use of innovative digital technologies in human resources management and predicted the evolution of the labour market situation under the influence of digital technologies and social networks (Manuti, de Palma, 2018); D. Waddill explored the fundamentals of the use of technology in human resource management and identified the technology trends most impacting the field of human resource management, including social networks, big data, data analytics, mobile applications and cloud platforms (Waddill, 2018, 2020). The prevailing opinion in the scientific literature is that although the use of artificial intelligence and virtual environments for HR management has not yet become widespread, the scale of their application may be growing.

There are several characteristics of this sector that determine the digitisation of human resource management in agricultural enterprises. The seasonality of work and the variability of work needs create the need for a flexible workforce management system that can respond quickly to changes. Distributed farms or fields require effective communication and coordination between workers, which can be achieved through digital tools such as video communication and shared platforms. Specific technological needs and equipment require staff training, which can be provided through digital technologies. Automating time management and

production processes helps to optimise workflows and ensure production efficiency. Finally, ensuring compliance with product safety and quality standards is an essential component of digitalisation, which can be achieved by monitoring and controlling production processes using digital tools. All these aspects point to the need for careful consideration of the specifics of the sector and the introduction of appropriate digital solutions to optimise human resource management in agricultural enterprises.

The specifics of the digitalisation of HR management at agricultural enterprises include unique challenges and opportunities associated with the nature of work at these enterprises, as well as with different categories of employees, such as agronomists, tractor drivers, and combine operators. The main vital aspects should be noted:

1. Diversity of skills and training needs. Farm workers may have different levels of computer literacy and technical skills. Successful digitalisation requires the development of training programmes that take this diversity into account and ensure that all employees have the necessary knowledge and skills.

2. Specificity of production processes and equipment. Tractor drivers, combine operators and other agricultural workers use specialised agricultural equipment that may require specialised technical knowledge. Digitalisation can include the introduction of digital tools for monitoring and diagnosing this equipment, as well as training staff in its effective use.

3. Flexibility in managing working hours and schedules. Working in agricultural enterprises can be associated with seasonality and variable working conditions. Digital time planning and communication tools can help optimise work schedules and respond effectively to changing working conditions.

4. Ensuring labour safety and product quality. Agricultural enterprises must comply with labour safety and product quality standards. Digitalisation can include the implementation of digital monitoring and control systems that allow for effective monitoring of compliance with these standards and prompt response to any problems or deviations.

5. Ensuring access to information and communication. For successful digitalisation, it is necessary to ensure that digital tools and technologies are available to all levels of staff, including agronomists, tractor drivers and combine operators, to ensure effective communication and information exchange.

6. Implementation of digital HR systems. The use of digital platforms and applications to automate HR processes, including time tracking, payroll, leave and other management aspects.

7. Development of e-learning systems. Use of electronic platforms for conducting educational courses, trainings and other forms of training to improve staff skills.

8. Use of analytics and Big Data. Collecting and analysing employee data to identify trends, forecast labour needs and make informed management decisions.

9. Development of staff mobile applications. Development of mobile applications that allow employees to conveniently manage their working hours and holidays, receive information about news and events at the company, etc.

10. Internet of Things (IoT) applications. They use IoT technologies to monitor and manage agricultural processes, including control over crops, soil moisture levels and other parameters that may affect the work of staff.

11. Application of artificial intelligence (AI) and machine learning. Using AI to optimise recruitment processes, forecast production needs and automate routine HR tasks.

Digitalisation, which integrates digital technologies into all areas of business activity, plays a crucial role in changing the HR management strategies of agricultural enterprises. The research has identified the main trends in the digitalisation of HR management in agricultural enterprises:

1. Use of digital tools in recruitment and selection. The introduction of online platforms for posting vacancies, conducting screening tests and interviews reduces the time and cost of finding candidates and makes the recruitment process more efficient.

2. Automation of administrative processes in human resources management. Use of digital systems for time tracking and payroll, personnel files and other administrative tasks, simplification and acceleration of routine processes.

3. Development of online learning and electronic platforms for staff development. The application of e-learning courses, webinars and other forms of training to improve employees' skills allows for continuous staff development without the high cost of organising training events.

4. Using analytics to make management decisions. Data on productivity, employee satisfaction, recruitment costs, and other metrics can be collected and analysed to help managers make informed decisions about workforce management and strategic planning.

5. Development of flexible working arrangements and remote work. Digital technologies that enable flexible work schedules and allow employees to work from remote locations contribute to a balanced work life and increase productivity.

However, it is important to bear in mind that successful digitalisation of HR management in

agricultural enterprises requires not only the introduction of new technologies, but also changes in culture and management practices to maximise their potential.

#### 4. Conclusions

The main trends in the digitalisation of farm personnel management indicate the widespread use of modern digital technologies to optimise and improve the efficiency of farm personnel management. In particular, one of the key trends is the use of digital tools in recruitment and hiring, including websites and online job search platforms, social media for attracting candidates, and automated candidate management systems and analytical tools for evaluating candidates. Digitalisation is enabling agribusinesses to respond more efficiently and effectively to staffing needs, attract and retain talented employees, and increase the overall productivity and competitiveness of the industry. Such technological changes are becoming a key element in the development of agricultural businesses in modern conditions and play an important role in ensuring their success and stability in the future.

The main trends in the digitalisation of HR management in agricultural enterprises include several key aspects aimed at using modern digital technologies to optimise HR management and increase efficiency. First, digital tools such as online platforms, websites and social media are used in recruitment and selection to attract and select candidates for vacant positions. The second trend is the automation of administrative HR processes. Digital systems allow automating time tracking, payroll, leave and other aspects of HR management, freeing up managers' time for more strategic tasks. The third trend is the development of online learning and electronic platforms for staff development. The use of digital tools for training and development of employees allows them to improve their skills and adapt them to changes in the industry. The fourth trend is the use of analytics to make management decisions. Analysing HR data allows managers to obtain objective information about the productivity and needs of their staff, which helps them make informed management decisions. In addition, the development of flexible forms of employment and remote work is another important trend. Digital technology allows people to work from anywhere, which helps to attract and retain talent no matter where they live.

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