

# Risk Management of Digital Transformation of HR Processes in Safety-Oriented Systems\*

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## Abstract

In a world that is constantly evolving, driven by technological advances and changing work dynamics, the role of HR professionals is no longer limited to traditional administrative tasks, but has expanded to include strategic planning, data analysis, and fostering a dynamic workplace culture. The HR departments of transforming government agencies are responding to a changing future. They will be working more flexibly, digitizing services, moving to other stages, or evolving through the merger of specific civil protection units. For these changes to be successful, the HR function must change with them. At the same time, the digitalization process is accompanied by certain challenges. The main obstacles include a lack of standardized approaches to implementing digital HR solutions, insufficient staff training, and the absence of a single digital environment for coordination between departments. Therefore, the digitalization of HR processes in the civil protection sector is a complex but extremely important task aimed at increasing the efficiency of public administration and improving the conditions of service for personnel. Successful implementation requires a comprehensive approach, coordinated interaction between all stakeholders, as well as the resolution of technical, organizational and legal issues.

## Keywords

HR management; transformation, HR-processes; state structures; digitalization, risk management

## 1. Introduction

The digitalization of HR processes in the civil protection service is an urgent task that directly affects the efficiency of public administration and the needs of personnel. In the context of martial law, the requirements for efficiency, convenience and accessibility of HR services and information resources are increasing, which requires the introduction of innovative approaches in this area. Modern digital technologies open up prospects for optimizing HR processes, minimizing bureaucratic procedures and improving the quality of service.

Currently, the system of providing personal data on service is not yet fully adapted to remote access, which creates difficulties for personnel. Many procedures remain labor-intensive, requiring significant resources and the physical presence of HR specialists, which makes it difficult for employees to access HR services. One of the key areas of digital transformation of the HR system is the development and implementation of modern information and communication technologies that will allow personnel to receive the necessary services online without visiting administrative offices, subordinate units or fire stations. The purpose of this article is to substantiate the theoretical foundations and practical approaches to the digital transformation of HR processes in the civil protection service under martial law, with a focus on systematizing the risks associated with the introduction of digital technologies.

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ITPM-2025: VI International Workshop "IT Project Management", May 22, 2025, Kyiv, Ukraine

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The study aims to form a methodological basis for assessing, forecasting and minimizing the risks of digitalization of the HR system, which will increase the efficiency of HR management, ensure transparency of HR procedures and strengthen the adaptive capacity of civil protection services to dynamic external conditions. The scientific novelty of the study lies in the comprehensive substantiation of a risk-based approach to the digitalization of personnel processes in the field of civil protection under martial law. The author proposes a unified risk matrix that takes into account not only technical and organizational factors, but also the specifics of public administration, personnel work under conditions of increased responsibility and psychological stress. For the first time, the relationship between digital HR tools and indicators of operational efficiency of civil protection personnel services is systematically described, and the role of interdisciplinary cooperation (HR departments, IT departments, lawyers, top management) in the process of digital transformation is emphasized.

Another important aspect is the introduction of reliable digital identification mechanisms to protect personal data and ensure the confidentiality of information. Automation of HR processes will help to improve the efficiency of HR management, reduce corruption risks and build trust among the staff. The State Emergency Service will be able to analyze HR data more effectively and make strategic decisions based on analytics.

## **2. Analysis of recent research and publications**

In their scientific works, S. Bushuyev, M. Dorosh, N. Shakun, D. Yazykov, N. Bushuyeva, F. Yaroshenko investigate the rapid development of project management as a science and its application in many subject areas that have their own specifics, has formed a wide range of knowledge and methodologies in world practice, most of which contain unique models, methods and management mechanisms. The mechanisms of system convergence proposed in the article provide an opportunity to create new methods and models of project management, taking into account different approaches to the convergence methods themselves. The chronological stages of the formation of project management methodologies are determined in comparison with the main stages of development of management systems in various applied industries. The necessary components of the project manager's innovative thinking, which ensure both the development of the industry and society as a whole, are also determined. The results of the study can be used in the selection and creation of new methodologies for making unique project decisions [1, 7, 13, 18, 22-24]. The scientific works of O. Zachko's school consider aspects of digitalization of HR management in project-oriented organizations in the safety sector, define criteria for the intelligent formation of project teams in safety-oriented systems, and propose a model for managing the content of infrastructure project mono-templates, taking into account changes in the project environment [9, 19-21]. At the same time, despite a significant amount of research, the issue of applying the methodology of digital transformation of HR systems in safety structures, as well as digital identification mechanisms that guarantee the protection of personal data and confidentiality of information, has not been sufficiently considered. The issue of digitalization of automated HR services has not yet received sufficient attention. At the same time, research in this area is being conducted regularly.

PMBok allows you to standardize project management processes across organizations and provides a broad overview of project management standards and practices. At the same time, the PMBoK is a universal approach that does not always take into account industry-specific features, in particular: the high level of regulation of the civil protection service; the need for integration with government accounting and reporting systems; and specific requirements for processing confidential information related to personnel [10].

P2M provides an approach to managing as individual projects and is focused on innovative projects in the organization. P2M is focused on innovative projects, and any changes in the civil protection service must comply with regulatory requirements and state standards. The methodology does not always take into account the need for strict compliance with the law [11].

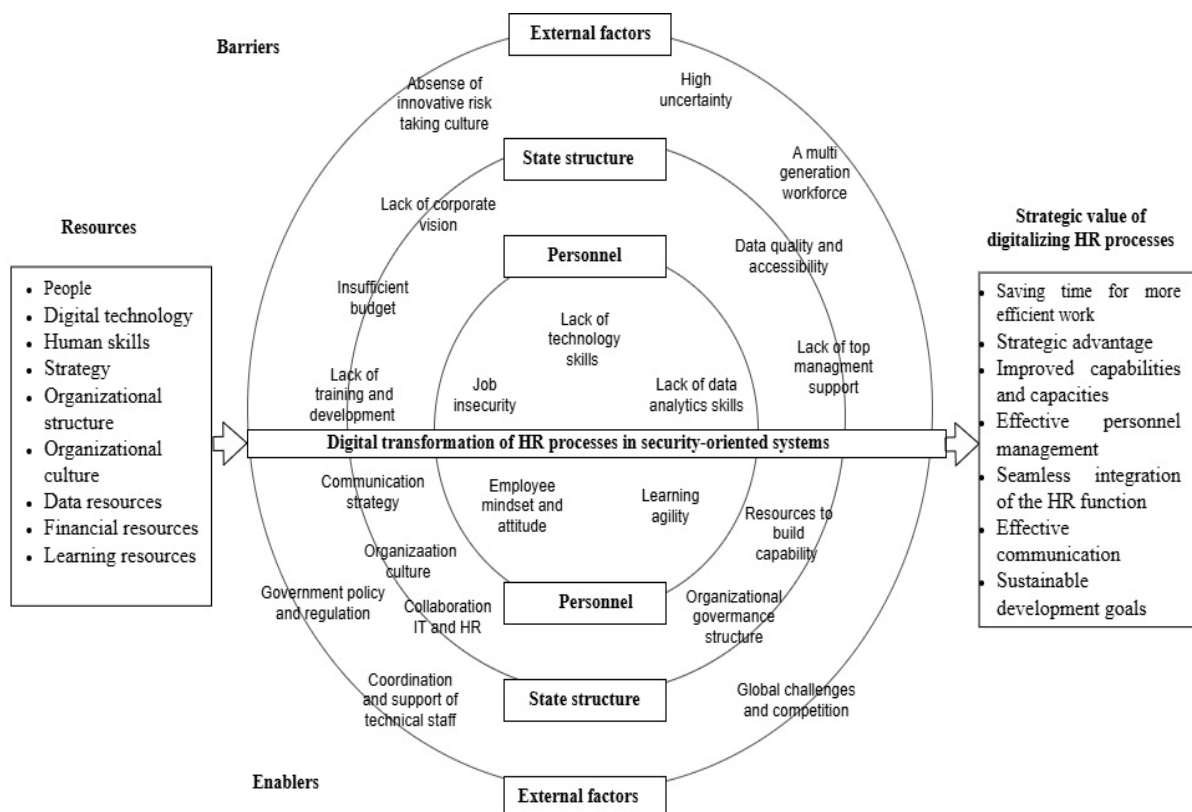
### 3. The bulk of research

The HR departments of transforming government agencies are responding to a changing future. They will be working more flexibly, digitizing services, entering other stages, or evolving through the merger of specific civil protection units. To make these changes successful, the HR function is changing with them. HR professionals want to optimize their time, increase productivity, and manage liability, reputation, and compliance risks. The transformation of HR management provides consolidated access to real-time data. This “one-stop shop” or HR support provides numerous benefits and prospects, including:

1. Data can be analyzed in real time without prior manual aggregation. Consolidated data can be used to automatically fill out a service contract, to generate service records for rank and file and to automatically fill out a certificate of employment. Equally important is the use of consolidated data for HR professionals to focus on what we missed, why we missed it, and how to fix it. These changes have another positive outcome: a satisfied workforce in the workplace. HR professionals who do repetitive and routine work now have great modern tools, allowing their roles to become more strategic and personal.

2. The management of departments and offices has real-time access to personnel data, including financial flows, such as interest payments, compensation for unused vacation days, seniority and preferential service. This is particularly valuable in times of uncertainty, when government agencies may need to respond quickly to disruptions to ensure they can maintain operations.

3. By continuously monitoring data in real time, government agencies can determine if something in their data is not showing up. Errors can be spotted quickly and problems can be identified earlier.



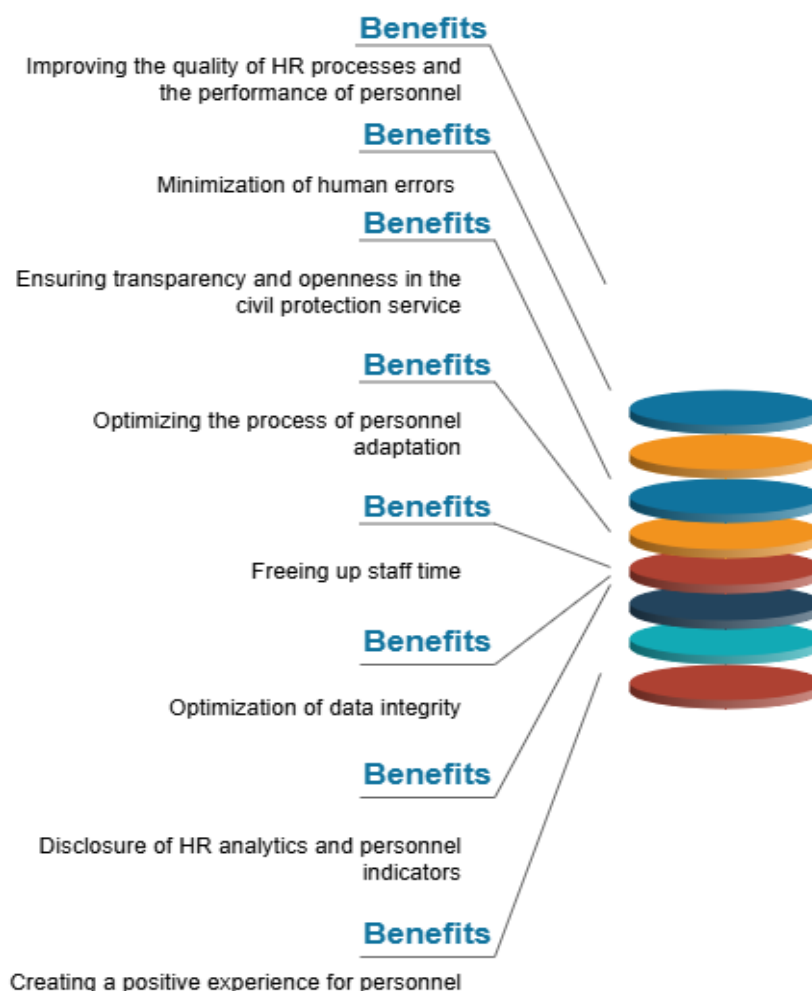
**Figure 1:** Demonstrated a model of digital transformation of HR processes in safety-oriented systems.

Automation of HR processes involves the use of technologies and software products to replace manual labor. In turn, this brings a number of benefits for government managers. The digital transformation of HR is a hot topic in the context of adaptive changes in the state in response to external factors. But it is one thing to talk about the digital transformation of public sector HR management than to do it. In other words, this digital transformation of HR

management involves both HR professionals and public sector organizations. This means that digital transformation will face certain risks during implementation. While these risks are common during cultural changes in public sector organizations, HR professionals need to upskill and retrain before engaging in organizational change.

It is important to note that for every organization, keeping up with technological trends and implementing digital transformation is critical and will not happen overnight. Addressing these challenges will be a primary requirement for HR professionals.

The digital era has brought about fundamental changes in the way government is run and how it implements policies. Governance transformation refers to the systemic adaptation of government to address the challenges and opportunities presented by advances in digital technology. The future of HR as a profession in other law enforcement agencies is characterized by a combination of technological innovation, data-driven decision-making, people-centric approaches, and the integration of societal change. Digital transformation is changing how HR teams in government agencies work and deliver value to their organizations, with significant implications for law enforcement talent management, organizational culture, and employee well-being. The study highlights key areas shaping the future of HR: strategic business partnerships, digital transformation, workforce metrics and analytics, engagement and management, purpose-driven initiatives, technology support, and workplace well-being.



**Figure 2:** Depicts the key benefits of digitalizing HR management.

**Table 1**

Systematization of risks for effective planning of measures to minimize threats during the digitalization of HR-processes in the civil protection service

Risk	Description	Probability	Impact	Risk level	Mitigation measures
Unreliability of digital platforms	There may be malfunctions in the software or systems used.	High	High	Critical	<ul style="list-style-type: none"> <li>- Selection of reliable software suppliers.</li> <li>- Regular testing of systems.</li> <li>- Ensuring data backup.</li> </ul>
Cyber Threats	Risk of unauthorized access to personnel information, leakage of personal data.	Medium	High	Critical	<ul style="list-style-type: none"> <li>- Use of multi-level authentication.</li> <li>- Regular cybersecurity audits.</li> <li>- Conducting staff training on cybersecurity.</li> </ul>
Insufficient staff qualifications	Staff may not have sufficient skills to work with digital systems.	High	Medium	High	<ul style="list-style-type: none"> <li>- Organization of education and training.</li> <li>- Availability of technical support.</li> <li>- Create instructions and step-by-step guides.</li> </ul>
Legal risks	Errors in automated processes can lead to violations of labor laws.	Low	High	Medium	<ul style="list-style-type: none"> <li>- Regular legal audit of HR processes.</li> <li>- Use of software with built-in legal standards.</li> <li>- Tracking changes in legislation.</li> </ul>
Employee resistance	Resistance to change due to fear of new technologies or distrust of digitalization.	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>- Informing about the benefits of digitalization.</li> <li>- Involving employees in the implementation of changes.</li> <li>- Ensuring transparency of the transition process.</li> </ul>
Incomplete integration of systems	Different digital platforms may not integrate properly, which	Medium	High	High	<ul style="list-style-type: none"> <li>- Conduct a technical assessment before implementation.</li> <li>- Select</li> </ul>

	complicates processes.					platforms with open APIs. - Set up integration and testing processes.
Data loss	Loss of important HR information due to disruptions or technical errors.	Low		High	Medium	- Regular backup of data. - Use of cloud technologies with a high level of reliability. - Testing of data recovery systems.
Ethical issues	The use of digital systems may result in data privacy violations.	Medium		Medium	Medium	- Developing privacy policies. - Controlling access to personal data. - Conducting regular internal audits.
Financial risks	High cost of implementing and maintaining digital solutions.	Low		High	Medium	- Raising funds at the design stage. - Budget planning. - Comparison of costs and savings from digitalization.

The latest information technologies will significantly accelerate the digitalization of human resource management. However, in terms of risk management, sufficiently effective tools and methods are still not available. Existing studies generally do not provide ready-made solutions for managing operational risks in a digital HRM system, given these shortcomings, the study of risk forecasting in digital HRM systems will outline the risk management mechanism in the civil protection service HRM system.

The key to the level of risk:

Critical: Requires immediate intervention.

High: Requires ongoing monitoring and action.

Medium: Monitoring and periodic review.

Low: The risk is acceptable, measures are minimal.

This matrix allows you to systematize risks in order to effectively plan measures to minimize threats during the digitalization of HR processes in the civil protection service.

The use of risk matrices in the digitization of HR processes in civil protection services is an important tool for ensuring internal processes are stable, secure and efficient. This approach allows for a systematic assessment of potential threats at each stage of digital transformation and ensures active management.

		The level of risk			
The probability of risk occurrence		Low	Medium	High	Cretinous
	Low	(1x1)1	(1x2)2	(1x3)3	(1x4)4
	Medium	(2x1)2	(2x2)4	(2x3)6	(2x4)8
	High	(3x1)3	(3x2)6	(3x3)9	(3x4)12
	Cretinous	(4x1)4	(4x2)8	(4x3)12	(4x4)16

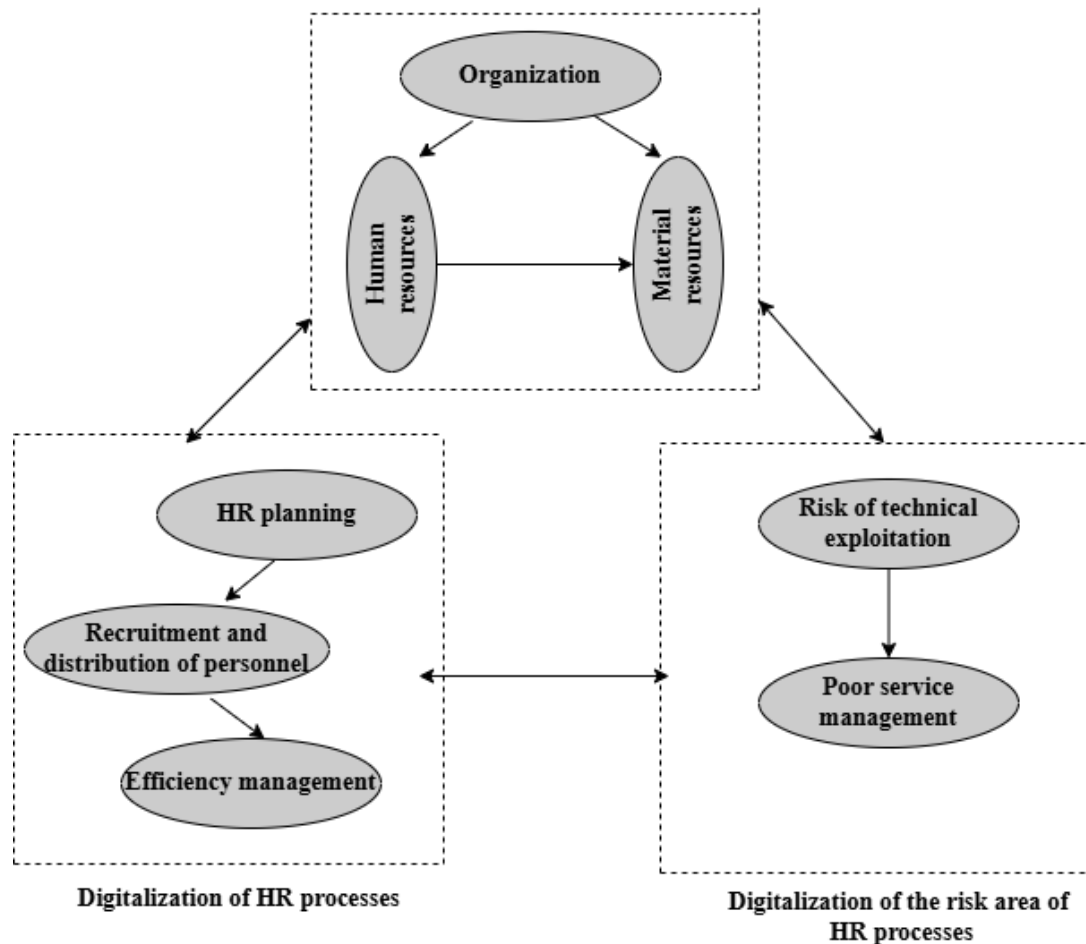
**Figure 3:** demonstrated risk matrix for digitalization of HR processes.

Digitization and staff functionality creates the prerequisites for daily temperature automation, workflow optimization, and increased transparency of your solution. On the other hand, it creates new types of risks, such as information safety, technology dependency, human factors in the use of new systems, and legal aspects of personal data storage.

Categorizing risks into critical, high, medium, and low risk allows you to clearly prioritize safety management. For example, the risk of data acceptance or system errors requires immediate measurements, but training issues and latency updates can gradually improve. This gives a balance between the level of digitization and safety levels.

It is important that the matrix is not a static document. It should be regularly updated to reflect technological changes, legal changes, and new safety concerns. It is also recommended that flexible governance mechanisms be put in place to monitor, feedback, train HR and digital processes on a regular basis.

In addition, the integration of the HRM system into private protection services should be implemented, taking into account the special features of the agency.



**Figure 4:** Digitalization of the risk area of HR processes is shown.

The private safety industry is characterized by high responsibility, staff stress tolerance, and the need for a quick response to emergencies. Therefore, digital tools must not only meet general standards but also adapt to the functionality of the service.

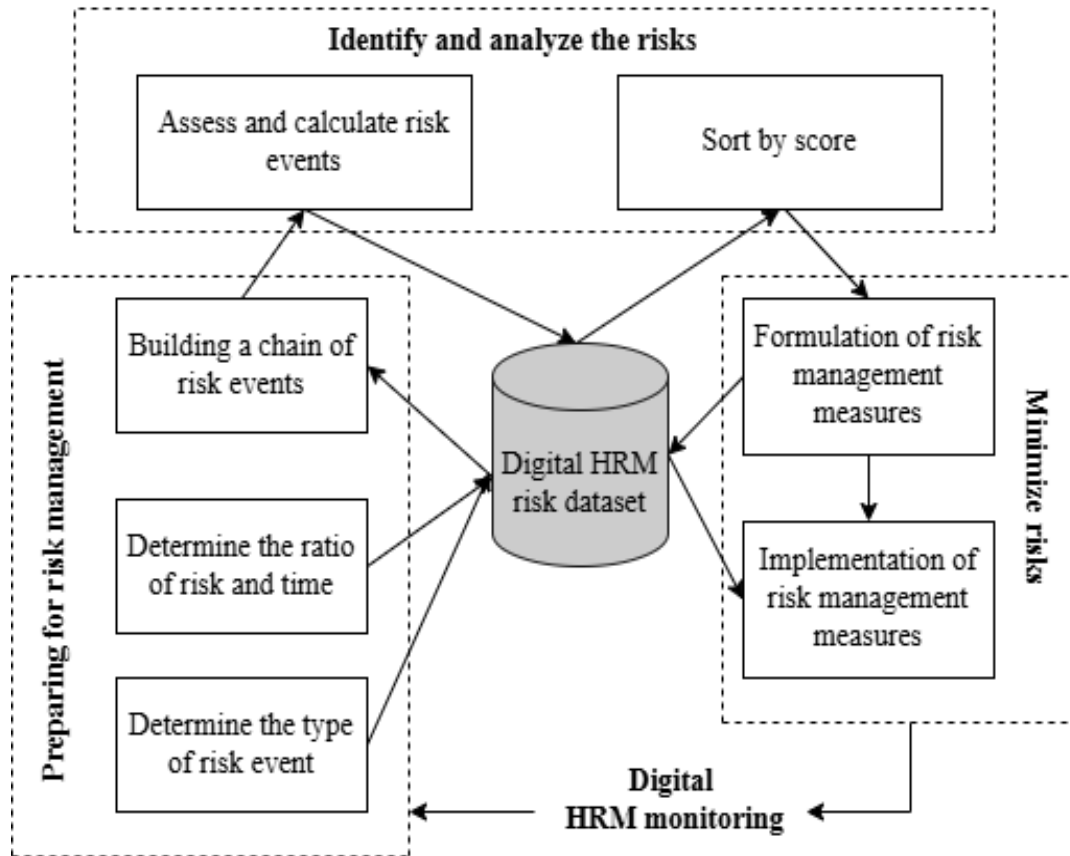
The importance of a team approach should also be emphasized. Digitization of functions

HR should work in collaboration with IT, HR, management, and local employees. This approach conveys a deeper understanding of the needs, reduces resistance to change, and improves the quality of the implemented solutions.

Overall, a risk matrix is a strategic tool that enables civil protection services to implement digital transformation thoroughly and effectively. Its use not only ensures not only technical stability but also social adaptation to new working conditions, but ultimately leads to overall improvements in the quality of human resources management and motivation for future challenges.

In the digital transformation of HR processes in civilian protection, risk cannot be avoided. Risk management in the automation of routine HR processes is about anticipating and preparing for potential downfalls to minimize the impact.





**Figure 5:** The article presents a mechanism for risk management in digital HRM, and the core of this mechanism is the creation of a data set.

During each management activity, the dataset will be updated. By extracting relevant data from the digital HRM dataset and combining it with input data from a series of risk events in history, measures can be formulated and implemented to manage digital HRM risks.

In the digital transformation of HR processes in civilian protection, risk cannot be avoided. Risk management in the automation of routine HR processes is about anticipating and preparing for potential downfalls to minimize the impact.

Digital transformation in the HR sector is a pressing topic in the context of adaptive changes in change to change external factors. But instead of doing this, one thing is to talk about the digital transformation of public sector human resource management. In other words, this digital transformation of HR involves both HR organizations and the public sector. This means that digital transformations are subject to certain risks during implementation. These risks are common in cultural changes in public structures, but HR professionals must improve their skills and iterate on organizational changes. When implementing technological trends and digital transformation, it is important to note that staying in all organizations is important and not soon. Addressing these issues is a major condition for HR professionals.

## 4. Conclusions

Digitalization of HR processes in the civil protection service is an urgent task that directly affects the efficiency of state administration and the provision of personnel needs. In conditions of martial law, the requirements for efficiency, convenience and accessibility of personnel services and information resources are increasing, which requires the implementation of innovative approaches in this area. Modern digital technologies open up prospects for optimizing personnel processes, minimizing bureaucratic procedures and improving the quality of service. Currently,

the system for providing personal data regarding service is not yet fully adapted to remote access, which creates difficulties for personnel. Many procedures remain labor-intensive, require significant resources and the physical presence of HR specialists, which complicates access to personnel services for employees of units. One of the key areas of digital transformation of the HR system is the development and implementation of modern information and communication technologies that will allow personnel to receive the necessary services online without visiting administrative institutions, subordinate units or fire stations.

The results were verified through expert analysis of the risk matrix by specialists in HR management, information security and public administration. Practical testing of the risk-based approach concept was tested on the example of a conditional model of the SES HR service, using scenario modeling of risks (cyberattack, system downtime, legal inconsistency) and appropriate response measures. The obtained results allowed to confirm the effectiveness of the proposed tools in terms of reducing the processing time of personnel requests, increasing the accuracy of accounting and improving the availability of services for staff.

Another important aspect is the implementation of reliable digital identification mechanisms to protect personal data and ensure the confidentiality of information. Automation of HR processes will help increase the efficiency of personnel management, reduce corruption risks and strengthen trust among personnel. The State Emergency Service will be able to more effectively analyze personnel data and make strategic decisions based on analytics. At the same time, the digitalization process is accompanied by certain challenges. Among the main obstacles are the lack of standardized approaches to the implementation of digital HR solutions, insufficient staff training and the absence of a single digital environment for coordination between units. Therefore, digitizing human resource management processes in the field of civil protection is a complex but extremely important task. Successful implementation requires a comprehensive approach, coordinated interaction between all stakeholders, as well as resolving technical, organizational and legal issues.

## **5. Acknowledgements**

Acknowledgements to the Ukrainian Project Management Association (UPMA), organizational committee of ITPM 2025 and management board of Lviv State University of Life Safety.

## **Declaration on Generative AI**

The authors have not employed any Generative AI tools in the writing of this paper.

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