

EVOLUTIONARY TRANSFORMATION OF HUMAN RESOURCE MANAGEMENT IN RESPONSE TO SHORT- AND LONG-TERM CHALLENGES

Shtangret A. M., Stetsiv L. P.

INTRODUCTION

At the present stage of the national economy's development, human resource management has evolved from a supporting administrative function into one of the key determinants of sustainable development and competitive advantage for industrial enterprises. The accelerating pace of technological change, the digitalization of managerial and production processes, the increasing implementation of the Industry 4.0 paradigm, the globalization of labour markets, demographic transformations, and intensifying competition for qualified employees have fundamentally reshaped the requirements for human resource management. Simultaneously, Ukrainian industrial enterprises continue to operate under martial law, facing profound socio-economic disruptions, the destruction of production facilities, the loss of productive capacity, large-scale migration, internal displacement, and workforce mobilization. Under these circumstances, traditional approaches to human resource management require substantial reconsideration, necessitating the development of a new management model capable of ensuring both an effective response to immediate crises and the long-term development of human capital.

The relevance of this study primarily stems from the simultaneous emergence of challenges of different temporal horizons within both the external and internal environments of industrial enterprises. These challenges differ significantly in their nature, scale, and implications for organizational performance. The dominant short-term challenge is the full-scale war, the further evolution of which into new threats and/or opportunities requires the application of flexible management mechanisms, the rapid adaptation of employee motivation systems, the improvement of personnel adaptation practices, and the enhancement of workplace safety conditions to sustain productive employee performance.

At the same time, long-term challenges are primarily driven by the ongoing digitalization of the economy within the broader framework of the Industry 4.0 paradigm. These developments require a transition from conventional personnel administration to strategic human resource management based on competency development, lifelong learning, the encouragement of employee creativity and innovation, and the personalization of motivation systems. A distinctive feature of the current stage is the simultaneous interaction between short-term and long-term challenges, creating an increasingly complex environment for industrial enterprises. The convergence of these challenges determines the evolutionary nature of human resource management transformation and highlights the need for an appropriate theoretical framework to explain and support this process.

1. Human resource management: conceptual foundations and challenges driving evolutionary transformation

Personnel management should first be considered from the perspective of clarifying the object of managerial influence, namely, personnel. It should be noted that two terms – staff and personnel – continue to be used in parallel in Ukrainian academic and professional discourse. The fundamental distinction lies in the fact that the former largely reflects the legacy of the traditional personnel administration system, whereas the latter has gained prominence through the translation and adoption of contemporary international approaches to human resource management. While staff is generally associated with permanent employees occupying established positions within an organization's staffing structure, *personnel* more accurately reflects the diverse forms of employment relationships that characterize the modern labour market.

Nevertheless, attempts to reconcile, reinterpret, and modernize these concepts remain evident in the literature. For example, O. Krushelnyska defines personnel as "...the principal permanent body of qualified employees, whose composition is formed and transformed under the influence of both internal factors (the nature of products, production technologies, and the organization of production) and external factors (demographic processes, legal and ethical standards, labour market conditions, etc.)"¹. This interpretation, however, remains constrained by the assumption that an employment relationship necessarily involves a formal labour contract linked to a designated position within the organizational staffing schedule.

The contemporary labour market differs substantially from this traditional model. The execution of specific tasks increasingly relies on short-term cooperation with individual specialists through part-time employment, civil law contracts, freelance arrangements, internships, and other flexible forms of engagement. From this perspective, the second conceptual approach offers a broader and more appropriate interpretation of the notion of personnel. V. Alkema², for instance, conceptualizes personnel as a complex organizational structure encompassing owners, core employees, and supporting staff who may participate under different forms of employment relationships but collectively possess the competencies and capabilities required for achieving organizational objectives.

This broader interpretation has been further refined by other scholars. V. Patron³ argues that personnel should not be viewed merely as another organizational resource. Unlike material or financial resources, employees possess individual interests that may coincide with, or only partially correspond to, the strategic interests of the enterprise. O. Melnyk⁴ emphasizes the decisive role of organizational interaction, arguing that every employee contributes to and shapes the organizational culture, which in turn exerts a

¹ Крушельницька, О. В., Мельничук Д. П. Управління персоналом. Київ: Кондор. 2007. 428 с.

² Алькема В. Г., Скиба В. М. Теоретичні засади формування системи управління персоналом сучасного підприємства. *Актуальні питання економічних наук*. 2025. №8. DOI <https://doi.org/10.5281/zenodo.14955853> (дата звернення 22.06.2026)

³ Патрон В. Д. (2020). Управління персоналом: теоретико-методологічні засади та практичні аспекти. Київ: КНЕУ, 312 с.

⁴ Мельник О. Г. Персонал як соціально-економічний ресурс підприємства: методологія та практика управління. Львів: Вид-во ЛНУ, 2019. 278 с.

significant influence on labour productivity. Z. Shershniova⁵ also recognizes personnel as a strategic resource but stresses its dynamic rather than static nature. Accordingly, human resources should be continuously developed through systematic investment and the creation of favourable conditions for synchronized professional and personal growth. The effective utilization of employees' individual potential requires sustained attention to educational, psychological, physiological, and communicative dimensions while simultaneously considering numerous contextual factors and their changing influence over time.

Summarizing the foregoing discussion, several conclusions can be drawn. First, the contemporary understanding of the concept of personnel is considerably broader than the traditional notion of staff. This conceptual evolution can largely be attributed to the growing influence of digitalization, production automation, labour market globalization, and the implementation of the Industry 4.0 paradigm. Under these conditions, personnel should be regarded as a strategic and dynamic organizational asset whose effectiveness depends not only on organizational efforts aimed at its development but also on the interaction between individual and corporate factors.

Within the context of industrial enterprises – the primary focus of this study – personnel may therefore be defined as the aggregate of employees engaged in employment relationships with an enterprise who, through their professional knowledge, competencies, skills, and experience, perform organizational functions and contribute to the achievement of both tactical and strategic objectives.

Based on this definition, the following key characteristics of personnel can be identified:

- a source of value creation, innovation, and competitive advantage, where effectiveness is determined not only by professional competencies but also by digital skills, adaptability, and the capacity for continuous learning;
- a carrier of organizational knowledge, capable of generating, codifying, sharing, and transferring knowledge, thereby transforming individual expertise into organizational knowledge and enhancing the effectiveness of investments in human capital;
- an agent of digital transformation, whose level of digital competence directly influences the pace of automation, robotization, the adoption of digital technologies, and the overall effectiveness of digital transformation initiatives within the enterprise;
- an active participant in the managerial process, contributing through continuous feedback mechanisms, the alignment of individual and organizational interests, and personal commitment to the successful implementation of managerial decisions;
- a key component of the enterprise's security system, simultaneously serving as both the subject and the object of organizational security, whose effective performance requires the establishment of safe working conditions while also demanding employees' active participation in safeguarding their own well-being, organizational resources, and corporate interests.

⁵ Шершніова З. Є. Стратегічне управління персоналом: сучасні концепції та моделі. Київ: Вид-во «Знання», 2021. 350 с.

Admittedly, the above list is highly generalized and does not fully capture the specific characteristics of human resource management within industrial enterprises. Nevertheless, it provides a sufficiently robust conceptual basis for further examining the essence and direction of the transformations currently taking place in human resource management.

The review of the existing literature demonstrates considerable scholarly interest in human resource management, resulting in the development of numerous conceptual approaches. Consistent with our interpretation of the concept of *personnel*, we refrain from providing a detailed review of established definitions. Instead, we focus on identifying their principal differences in order to develop our own conceptual approach, emphasizing those aspects that are most relevant to the objectives of this study, particularly employee motivation and the impact of the Industry 4.0 paradigm.

As in the case of the concept of personnel, contemporary interpretations of human resource management clearly demonstrate continuity with earlier theoretical perspectives. An illustrative example is provided by L. Daineko, who defines human resource management as "...a system of measures aimed at attracting, utilizing, developing, and retaining an enterprise's labour resources"⁶. This continuity is reflected in the sequential organization of the principal processes governing the interaction between the enterprise and its employees. Such a process-oriented approach is based on managerial control, whereby management determines the requirements and conditions of employment. Under contemporary conditions, however, this perspective can only serve as a conceptual foundation. It must be supplemented by approaches that consider not only organizational objectives but also employee characteristics and the broader set of environmental factors shaping the employment relationship.

V. Hryniova⁷ further develops this perspective by emphasizing that the achievement of organizational objectives depends upon incorporating socio-psychological aspects into the employment relationship throughout the entire employee lifecycle – from identifying staffing needs and recruiting candidates to employee separation, including the possibility of transferring departing employees to a talent pool in order to preserve their sense of affiliation with the organization. S. Vasylchuk⁸ focuses on the managerial toolkit employed within the human resource management process. In addition to traditional methods and instruments, the author emphasizes that their purpose extends beyond increasing current labour productivity to creating the conditions for future organizational performance through competency development, employee motivation, and a supportive corporate culture. V. Derykhovska⁹ conceptualizes human resource management as a strategic organizational function characterized by long-term planning and the gradual achievement of strategic objectives.

⁶ Дайнеко Л. П. Системний підхід до управління персоналом підприємств: навчальний посібник. Дніпро: Ун-т ім. Альфреда Нобеля, 2018. 240 с.

⁷ Гриньова В. М. Менеджмент персоналу: соціально-психологічні аспекти управління. Харків: ХНЕУ, 2020. 296 с.

⁸ Васильчук С. О. Розвиток компетенцій персоналу в умовах цифрової трансформації економіки. Одеса: ОНУ, 2022. 310 с.

⁹ Дериховська В. І. Взаємозв'язок розвитку персоналу та стратегії управління персоналом. *Бізнес Інформ*. 2013. № 7(426). С. 341–347.

These perspectives can be complemented by another approach that reflects systems thinking while moving beyond the traditional emphasis on managerial control. V. Ruliev defines human resource management as "...a systematically organized process of reproducing and effectively utilizing the entire workforce of an organization to achieve its established objectives"¹⁰. Although the author's use of the term staff limits the scope of the management object to permanent employees, the emphasis on workforce reproduction is particularly significant, as it highlights the necessity of maintaining an adequate level of human resource potential despite the combined influence of numerous internal and external factors.

Although only selected conceptual positions have been examined, the preceding analysis provides sufficient grounds for defining human resource management as a system of principles, methods, and managerial instruments aimed at developing, enhancing, and effectively utilizing personnel through competency development (knowledge, skills, personal attributes, and professional experience), strengthening organizational commitment, and improving adaptability to change in order to achieve both strategic and operational organizational objectives.

Based on the contemporary characteristics of personnel identified above, the following fundamental principles of human resource management can be distinguished:

- strategic orientation, achieved through the integration of human resource management with the overall business strategy by means of strategic workforce planning, talent pool development, and forecasting future competency requirements;
- human capital development, aimed at strengthening the enterprise's competitive advantage through continuous enhancement of professional competencies, expanding opportunities for knowledge acquisition and application, and encouraging creativity and innovation in employees' daily activities;
- digitalization of employer–employee interactions, encompassing automated recruitment, electronic human resource administration, and artificial intelligence technologies for employee assessment, performance monitoring, and decision support;
- continuous professional development, consistent with the principles of lifelong learning, including systematic training and reskilling, the development of digital competencies, the expansion of employees' functional versatility, and the design of individualized career development pathways;
- strengthening employee commitment, through the development of corporate culture, continuous improvement of motivation programmes, partnership-based employment relationships, and more effective internal communication, including the use of social media and other digital communication platforms;
- ensuring employee well-being and organizational security, extending beyond occupational health and safety to encompass psychological support for employees and their family members, as well as initiatives aimed at improving employees' physical and mental well-being in order to sustain high levels of productivity.

Taken together, these principles indicate that under current conditions the traditional objective of satisfying workforce requirements constitutes only the foundation of human resource management. Contemporary HRM has evolved into a comprehensive system

¹⁰ Рудьєв В. А., Гуткевич С. О., Мостенська Т. Л. Управління персоналом. Київ: КОНДОР, 2012. 324 с.

for creating sustainable competitive advantage through competency development, employee commitment, creativity, organizational security, and continuous professional self-improvement.

Although this study does not provide a comprehensive review of the major theoretical approaches to human resource management, particular attention should be given to the systems approach, which remains one of the most influential perspectives in the field. This approach offers a holistic understanding of horizontal interrelationships and hierarchical structures, particularly within the human resource management system. For the purposes of this study, it is especially valuable because it clearly illustrates the differences between traditional and contemporary HRM models.

The traditional approach is aptly characterized by V. Alkema¹¹, who describes it as based on "...a rigid hierarchy, administrative control, and the regulation of employees' activities through clearly prescribed job responsibilities, leaving little opportunity for self-realization or creative expression." The defining characteristic of such a system was organizational stability, achieved through a high degree of managerial control, including control mechanisms intended to mitigate personnel-related risks. Under present-day conditions, however, this former strength has largely become a limitation, constraining employee creativity and reducing organizational flexibility in assembling temporary multidisciplinary teams to perform specialized tasks. Furthermore, this traditional model primarily focuses on filling vacant positions while paying insufficient attention to employee motivation, organizational commitment, and continuous professional development.

Researchers have increasingly recognized the discrepancy between the realities of today's labour market and the conventional structure of human resource management systems. One such conceptualization is proposed by M. Hodiashchev¹², who distinguishes eight functional HR subsystems. Four correspond to the traditional HR functions – workforce analysis and planning, recruitment and personnel administration, motivation, and performance evaluation – whereas the remaining four reflect the evolving business environment by emphasizing employee development, the creation of favourable working conditions, information support, and legal support.

Consistent with the conceptual position adopted throughout this study, and building upon the refined interpretations of both personnel and human resource management, we propose that the human resource management system should comprise the following interconnected subsystems:

- workforce planning, responsible for identifying both current and future staffing requirements;
- recruitment and onboarding, encompassing candidate attraction, selection, and integration into the organizational environment;
- performance assessment, including pre-employment testing and interviews, together with continuous evaluation of employee performance, competencies, and development potential;

¹¹ Алькема В. Г., Скиба В. М. Теоретичні засади формування системи управління персоналом сучасного підприємства. *Актуальні питання економічних наук*. 2025. №8. DOI <https://doi.org/10.5281/zenodo.14955853> (дата звернення 22.06.2026)

¹² Годащев М. О. Управління персоналом підприємства як фактор підвищення його ділової активності. *Інтелект XXI*. 2017. №3. С. 74–79.

- motivation, responsible for designing and implementing both individual and collective financial and non-financial incentive systems;
- learning and development, covering professional training, reskilling, upskilling, and the enhancement of employees' digital competencies;
- career and workforce mobility, governing employee transfers, promotions, changes in working arrangements (including work schedules and remote work), and other forms of workforce movement;
- corporate culture, aimed at fostering a positive socio-psychological climate and promoting adherence to shared organizational values.

The proposed structure of the human resource management system is characterized by a high degree of flexibility in employer–employee interactions while simultaneously recognizing employees as a strategic organizational resource whose potential can be fully realized only under favourable organizational conditions. Such conditions facilitate the development and effective utilization of individual capabilities, thereby generating a synergistic effect through the integration of employees' competencies in pursuit of organizational objectives. At the same time, the identified subsystems inherently incorporate a proactive response to contemporary challenges, which simultaneously create new opportunities and potential threats. This also demonstrates the adaptability of the HRM system itself, as further environmental changes will inevitably require its continuous transformation.

The existing body of research reveals both common and divergent perspectives regarding the challenges driving the transformation of enterprise human resource management systems. Consensus primarily concerns the identification of similar categories of challenges, whereas differences arise in the interpretation of their nature and the assessment of their positive and negative consequences. This can be illustrated by comparing two studies addressing similar research problems.

M. Hodiashchev identifies a range of contemporary HR challenges, including "...employee dissatisfaction with wage levels, high staff turnover, and related issues"¹³. This approach essentially acknowledges the existence of these challenges while emphasizing that their consequences vary depending on the specific circumstances of individual enterprises. By contrast, M. Rossokha and his co-authors¹⁴ focus exclusively on crisis-related challenges, particularly those resulting from the full-scale war. Accordingly, their analysis considers only those factors that generate new organizational risks and threats. Despite these differences in perspective, both studies identify employee turnover and declining work motivation as central HR challenges.

The underlying causes of these and other challenges are explained through the specific circumstances in which they arise and the mechanisms through which they affect enterprise performance. For example, high employee turnover is associated with labour migration, refugee outflows to European Union countries, military mobilization, employees' search for better career opportunities, and the current imbalance in the labour market, where labour demand substantially exceeds labour supply with little prospect of

¹³ Годащев М. О. Управление персоналом предприятия как фактор повышения його ділової активності. *Інтелект XXI*. 2017. №3. С. 74–79.

¹⁴ Россиха М. Ю., Коротич А. О., Тицька А. О. Стратегії управління ефективністю та продуктивністю персоналу в умовах кризових викликів та воєнного стану. *Економічний простір*. 2025. №199. С. 262–267.

short-term correction. Similarly, the motivational dimension has undergone significant transformation. Monetary compensation has become relatively less important because concerns regarding personal safety increasingly dominate employees' decision-making. For men of mobilization age, reservation from military service often outweighs salary considerations when evaluating employment opportunities. For women, jobs offering remote work and flexible working arrangements have become particularly attractive, as they facilitate the simultaneous fulfilment of professional responsibilities and caregiving duties for children and other dependent family members.

Our position differs in that every challenge should be viewed comprehensively rather than solely as a crisis phenomenon. High employee turnover, for instance, undoubtedly represents a serious organizational problem. However, when it affects the majority of enterprises within a given industry, including competitors, it simultaneously creates new strategic opportunities. Investing in the development of individual human capital requires substantial financial resources and involves considerable uncertainty. Comparable results, however, may be achieved by attracting qualified specialists from competing organizations through the provision of more favourable employment conditions. Under conditions of high labour mobility, enterprises can recruit experienced professionals while incurring significantly lower initial training costs. Although subsequent investments in employee development remain necessary, they primarily involve updating existing competencies rather than developing them from the ground up. Equally important is the fact that workforce shortages among competitors weaken their competitive position, thereby creating strategic advantages for enterprises capable of responding more effectively to this challenge. This example further supports our earlier argument for distinguishing recruitment and onboarding as a separate subsystem within the human resource management system.

Building upon these considerations, the author's conceptual framework is based on identifying the principal challenges that determine both the dynamics and the direction of transformation within the human resource management systems of industrial enterprises. These key challenges include:

- the shortage of qualified personnel, resulting from demographic decline, extensive labour migration, the large-scale displacement of Ukrainian citizens to European Union countries, military mobilization, and structural imbalances in the labour market, where many unemployed individuals possess higher education qualifications but demonstrate limited willingness to undertake vocational retraining. Although workforce shortages threaten enterprise performance, similar shortages among competitors may create strategic advantages for organizations capable of attracting scarce talent;
- digital transformation and the accelerated implementation of Industry 4.0, driven by intensifying global technological competition that increasingly distinguishes technologically advanced economies from resource-oriented countries with significantly lower levels of economic prosperity. Automation, robotics, and the expanding use of artificial intelligence contribute to higher labour productivity and technological leadership. However, these benefits are constrained by inadequate digital literacy, the substantial costs associated with developing digital competencies, and organizational resistance to change;
- the necessity of continuous learning, arising from the rapid obsolescence of previously acquired knowledge and skills. Increasing technological sophistication

enables more efficient utilization of organizational resources but simultaneously requires employees to engage in continuous professional development. Consequently, enterprises must cultivate a culture of lifelong learning by financing education and training programmes while facilitating rapid adaptation to emerging technologies;

- intensifying competition for human capital, which has effectively eliminated geographical boundaries. Industrial enterprises must now compete for highly qualified employees not only with organizations operating within the same industry but also with domestic enterprises offering more attractive employment conditions and with foreign companies recruiting internationally;

- knowledge retention and transfer. The ageing workforce characteristic of many industrial enterprises contributes to workforce stability while simultaneously creating the risk of losing valuable tacit knowledge that underpins product and service quality. Since professional expertise resides primarily in individual employees, only systematic knowledge formalization and structured mentoring programmes can transform individual knowledge into organizational knowledge while reducing the risk of knowledge loss;

- changing approaches to employee commitment and motivation. The combined impact of military conflict and rapid digitalization has fundamentally altered employees' priorities. Financial rewards have partially given way to concerns regarding workplace safety, professional development, creative self-realization, and the sense of contributing to organizational objectives and socially significant goals at the community, regional, and national levels. Although moderate wage growth enables enterprises to maintain competitive product prices, it must be complemented by comprehensive non-financial incentive systems;

- organizational change management, necessitated by the need to adapt enterprises to rapidly changing operating conditions. Successful implementation requires overcoming employee resistance while fostering a culture of innovation through transparent communication regarding the necessity and mutual benefits of organizational transformation;

- ensuring employees' socio-psychological resilience, which has become essential for maintaining labour productivity despite the adverse consequences of war and related stressors. This requires implementing comprehensive measures aimed at preventing occupational burnout while promoting psychological well-being and resilience;

- providing safe working conditions, which, under current circumstances, should be considered from two complementary perspectives. The first concerns additional investments in bomb shelters, backup energy and communication systems, first-aid and psychological support services, and strengthened occupational safety procedures. The second concerns the positive outcomes of these investments, including reduced workplace injuries and the development of a safety-oriented organizational culture, which also contributes to stronger employee commitment and organizational loyalty;

- the growing dynamism of labour market conditions, which requires the adoption of flexible human resource management models. Traditional rigid organizational structures are increasingly being replaced by project-based and matrix structures. While these models offer significant advantages—including rapid adaptation, faster managerial decision-making, stronger performance orientation, and improved employee motivation – they also present challenges, particularly for medium-sized and

large industrial enterprises, where reduced managerial control may increase organizational security risks.

The findings of the above analysis are summarized graphically in Figure 1.

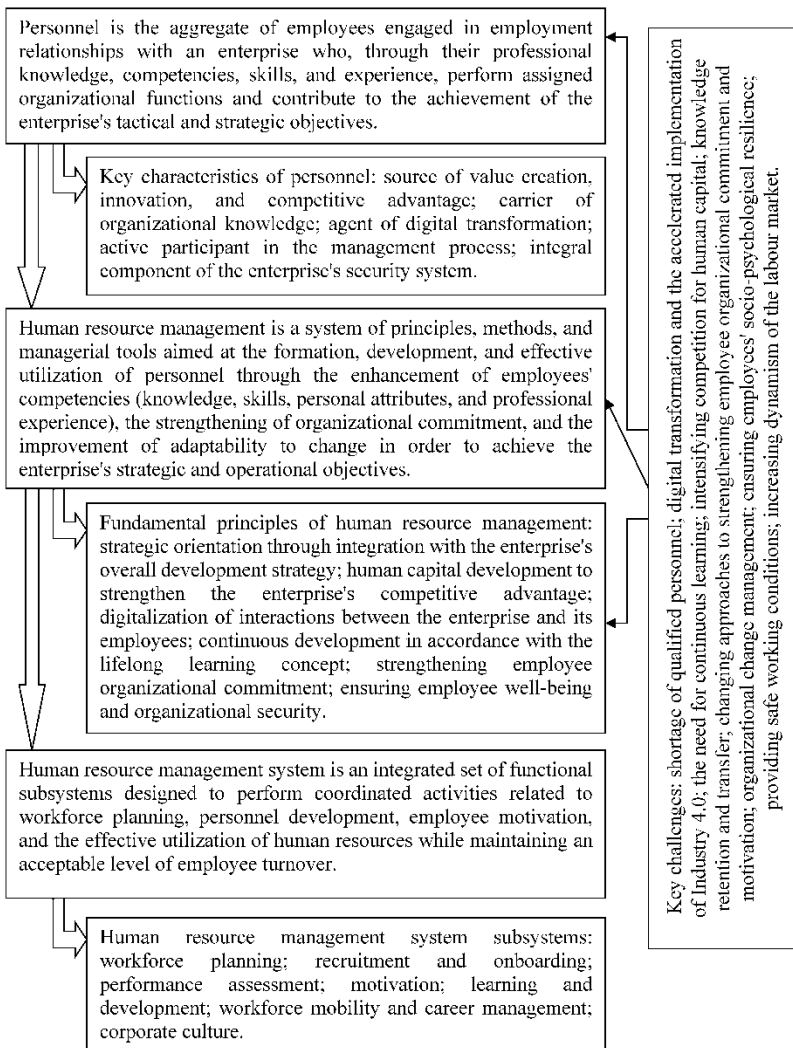


Fig. 1. Evolution of the conditions and principles of human resource management. developed by the authors

The findings obtained provide a comprehensive perspective on the underlying causes, nature, and potential responses to one of the most significant challenges confronting contemporary enterprises. For Ukrainian industrial enterprises, this challenge is represented by personnel, which simultaneously constitute the strategic foundation for organizational development and competitive advantage while remaining one of the most complex objects of management due to the diversity of employees' individual interests. Consequently, effective human resource management requires the alignment of individual and organizational interests, thereby generating positive outcomes in the form of higher labour productivity and improved organizational performance. Conversely, the failure to achieve such alignment gives rise to organizational risks that undermine business resilience and overall enterprise security.

As demonstrated above, the identified challenges possess a dual nature. While they undoubtedly generate new risks, they also create opportunities that can be realized through timely managerial responses and the continuous evolutionary transformation of human resource management practices. Accordingly, the competitive position of industrial enterprises increasingly depends not merely on their ability to react to environmental changes but on their capacity to proactively redesign HRM systems in accordance with emerging technological, economic, and social conditions. The subsequent chapters therefore focus on two interrelated challenges that are particularly significant for the long-term development of Ukrainian industrial enterprises: the transformation of employee motivation systems and the impact of digitalization and the broader implementation of the Industry 4.0 paradigm on human resource management. These challenges are regarded as the principal drivers of the evolutionary transformation of contemporary HRM systems and therefore warrant more detailed theoretical and practical examination.

2. The evolution of human resource management systems under the influence of Industry 4.0

The terms "the Fourth Industrial Revolution" and "Industry 4.0" are closely related but should not be regarded as synonymous. To clarify this distinction, it is necessary to briefly consider the historical developments that preceded these concepts, with particular reference to their implications for human resource management.

The eighteenth and nineteenth centuries are commonly associated with the First Industrial Revolution, which originated in what is now the United Kingdom before gradually spreading to other countries. Its defining features included significant advances in the textile and metallurgical industries. Accelerated industrial production became possible through the use of steam power, the mechanization of manufacturing processes, and the transition from artisanal production to the factory system. These transformations fundamentally altered the utilization of labour resources by partially or completely replacing manual labour with machine-based production. While this reduced the demand for human labour in certain operations, it simultaneously increased qualification requirements for workers. The growing division of labour resulted in a high degree of job specialization. At the same time, industrial production required stricter labour discipline and closer supervision of compliance with production standards, making administrative control the dominant characteristic of human resource management during this period.

From the late nineteenth century until the middle of the twentieth century, the replacement of the steam engine by electric power laid the foundation for the transition to mass production. This new stage further intensified the requirements imposed on

employees, particularly regarding the continuous improvement of their professional skills in response to the rapid pace of technological change. Human resource management increasingly focused on labour standardization and the development of material incentive systems, both of which were intended to enhance labour productivity.

Beginning in the second half of the twentieth century, industrial development was characterized by the widespread adoption of information technologies, automation, robotics, and the expanding use of computer technologies across production processes. Digitalization and automation also became integral components of human resource management. However, unlike previous industrial stages, employees increasingly came to be viewed as carriers of professional knowledge. Consequently, greater emphasis was placed on creating organizational conditions conducive to the generation, dissemination, and effective utilization of knowledge, particularly through the development of a corporate culture that strengthened employees' commitment to the enterprise.

Artificial intelligence, Big Data, the Internet of Things, digital platforms, and other advanced digital technologies have become the technological foundation of the Fourth Industrial Revolution. The current level of technological development already enables the creation of fully autonomous automated manufacturing facilities characterized by highly flexible production systems, where the role of human labour is largely limited to task setting and overall supervision. A more widespread model, however, envisages close interaction between employees and intelligent machines, thereby requiring the development of advanced digital competencies, greater emphasis on creativity, the establishment of an innovation-oriented working environment, and the adoption of flexible forms of work organization.

In summary, each successive industrial revolution has driven profound transformations in human resource management. Whereas earlier approaches were primarily based on administrative control, contemporary priorities focus on maintaining the relevance of employees' digital competencies while creating favourable conditions for knowledge generation and creative problem-solving. These capabilities have become essential determinants of the competitiveness and long-term sustainable development of industrial enterprises.

With regard to the term "Industry 4.0," the literature presents a variety of interpretations, including its characterization as a governmental programme, a development strategy, or a conceptual framework. From a historical perspective, Industry 4.0 originated as Germany's national industrial development initiative introduced in 2011 with the objective of achieving global leadership in exploiting the opportunities created by the Fourth Industrial Revolution. Within this initiative, the state assumed the role of coordinating technological transformation aimed at strengthening the international competitiveness of German manufacturers. Additional policy instruments included long-term public funding, protectionist measures, and the promotion of national industrial interests through political and economic influence in international markets.

The successful German experience was subsequently adapted by most economically developed countries, although with different titles and strategic priorities. For example, in 2013 the United Kingdom launched the High Value Manufacturing Catapult initiative, establishing a high-technology manufacturing centre designed to strengthen cooperation among industry, the banking sector, and research institutions in order to accelerate the development of advanced manufacturing. In China, a similar programme introduced in 2015 primarily focused on the modernization of the defence industrial sector, whereas Japan emphasized increasing its participation in global value chains. Ukraine introduced its own Industry 4.0 framework in 2018, drawing upon international best practices with

the strategic objective of becoming a regional leader in the provision of high-technology services.

The conceptual foundations of Industry 4.0 were established by Klaus Schwab, who defined it as “...a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres”¹⁵. It is noteworthy that subsequent interpretations have primarily focused on expanding the list of digital technologies, whereas the original concept emphasized the importance of the biological dimension, namely human resources. Personnel are expected to interact effectively with one another to generate innovative products that satisfy consumer needs at a qualitatively higher level while maintaining the lowest feasible environmental impact.

Under current conditions, there is no viable alternative to adopting the principles of Industry 4.0. The view expressed by Olha Hnylianska is well-founded, namely that Industry 4.0 technologies “...enable enterprises to increase productivity, reduce costs, and improve product quality”¹⁶. These outcomes are primarily driven by faster responses to changes in market demand and more efficient utilization of resources, including human capital. However, these advantages are accompanied by significant challenges, the most important of which are cybersecurity risks and the need to transform organizational culture while continuously developing employees' digital competencies. The latter aspect is accurately reflected by Yuliia Fedorova, who argues that “...the digital transformation of the workplace changes the employee's labour role, transforming them into a user of digital content and services and, accordingly, necessitating the development of specialized competencies”¹⁷. While agreeing that specialized digital competencies require continuous updating, we consider the implied reduction of the employee's role to be debatable. In the context of industrial enterprises, digital transformation should rather be understood as a shift from physical labour toward knowledge-intensive work, which should be taken into account in the further transformation of human resource management systems.

Ukraine adheres to the principle of studying international best practices and following global leaders. This approach has been reflected in the national development of the Industry 4.0 agenda. Nevertheless, a more important issue is the country's readiness to implement digital transformation. It should be emphasized that this challenge is not unique to Ukraine. According to analytical evidence¹⁸, in 2018 only 25 out of 100 countries possessed the capacity to rapidly implement digital technologies. Today, several international indices assess countries according to their progress in implementing the Fourth Industrial Revolution. Since this study focuses on industrial enterprises, statistical data relating specifically to manufacturing enterprises were selected from official databases. The analysis covers indicators reflecting both the level and dynamics of digital technology adoption and the effectiveness of their utilization.

¹⁵ Schwab K. (2016). The Fourth Industrial Revolution. World Economic Forum

¹⁶ Гнилянська О. В. Адаптація менеджменту до викликів «Індустрія 4.0»: відмінності та стратегія. *Актуальні проблеми сталого розвитку*. 2024. №2. С. 29–36.

¹⁷ Федорова Ю., Проценко К., Слепцов О., Азарова М. Підготовка управлінського персоналу в умовах цифровізації. *Адаптивне управління: теорія і практика*. 2022. Вип. 14(28). [https://doi.org/10.33296/2707-0654-14\(28\)-14](https://doi.org/10.33296/2707-0654-14(28)-14) (дата звернення 26.06.2026)

¹⁸ Readiness for the Future of Production Report 2018. World Economic Forum. URL: <https://www.weforum.org/reports/readiness-for-the-future-of-production-report-2018> (дата звернення 26.06.2026)

It should first be noted that statistical information is available for the period 2017–2025¹⁹; however, most datasets are fragmented and therefore incomplete. The highest values are observed for two indicators: the share of enterprises with a corporate website (48.2% in 2024) and the share using social media (30.2% in 2024). Owing to incomplete time series, long-term trends are difficult to assess, although the corresponding figures in 2019 were 43.25% and 29.4%, respectively. Despite this moderate progress, these indicators alone do not demonstrate the effective use of digital technologies to strengthen communication with customers and business partners. This conclusion is supported by the fact that in 2024 only 9% of industrial enterprises engaged in e-commerce, while revenue generated through electronic sales accounted for merely 2.5% of total net sales revenue.

As noted above, the Fourth Industrial Revolution is characterized by the robotization and automation of industrial production. Actual performance indicators – specifically, the fact that only 7.2% of enterprises used robotics, including just 3.3% employing industrial robots – clearly demonstrate Ukraine's substantial lag behind leading countries. Similar conclusions can be drawn from the adoption rates of key digital technologies. For example, the share of enterprises using 3D printing reached only 3.6% in 2020, the Internet of Things (IoT) 8.1% in 2022, and Big Data technologies 14.8% in 2025. By comparison, in Germany in 2025, 44% of manufacturing enterprises had implemented 3D printing technologies, 45% had adopted IoT solutions, while an additional 33% planned their implementation, and 48% were using Big Data technologies.

The identified gap provided the basis for refining the directions of human resource management transformation in industrial enterprises under the influence of Industry 4.0. These directions also take into account the positive development prospects and the opportunities that Ukrainian enterprises may gain from the structural changes induced by the war:

- transformation of the employee's role, whereby supervision of standardized operations is replaced by encouraging initiative, continuous self-development, and collaborative problem-solving to identify optimal production solutions;
- revision of workforce competency requirements, particularly regarding digital literacy, the ability to operate automated production systems, systems thinking, critical thinking, readiness for lifelong learning, creativity, and innovation capability;
- implementation of electronic HR documentation systems, together with the application of artificial intelligence technologies for employee selection and workforce productivity monitoring;
- expansion of continuous learning programmes through online educational platforms and the development of individualized professional development pathways;
- modernization of motivation systems by individualizing incentives for professional development, supporting innovation activities, promoting flexible forms of work organization, and recognizing employees' intellectual contributions;
- management of organizational change through strengthening employees' readiness for transformation, overcoming resistance to change, improving internal communication, and providing psychological support for employees.

The proposed conceptual framework is summarized graphically in Figure 2.

The identified directions take into account the actual readiness of industrial enterprises for digital transformation, the current operating environment under wartime

¹⁹ Статистичні дані. Державна служба статистики. URL : <https://stat.gov.ua> (дата звернення 26.06.2026)

conditions, and the benchmarks that determine the pace of corresponding changes in leading economies. They are primarily focused on accelerating the development of digital competencies, retaining the workforce, and integrating digital technologies into human resource management.

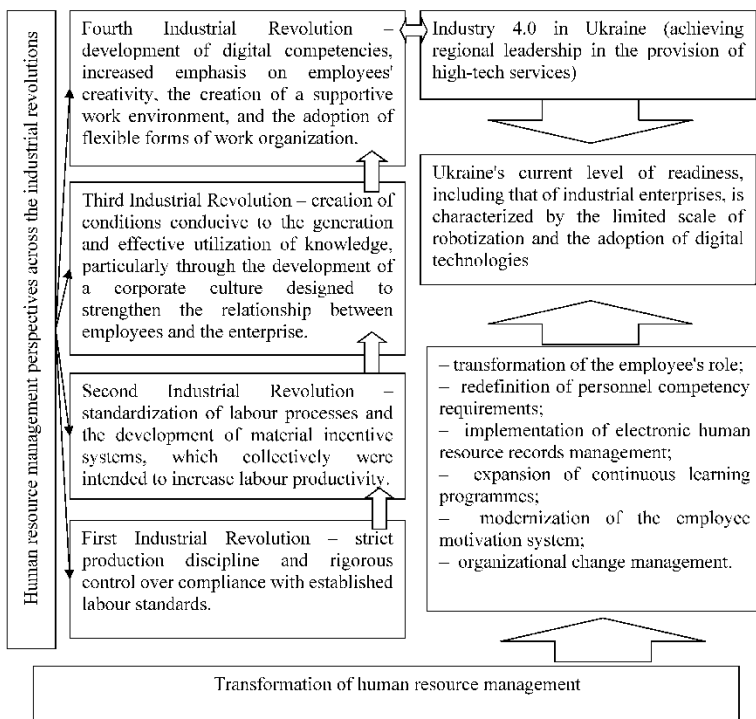


Fig. 2. Directions of Human Resource Management Transformation in Industrial Enterprises under the Influence of Industry 4.0, developed by the authors

3. Evolution of Employee Motivation Systems under the Influence of the War and Industry 4.0

Peter Drucker²⁰ is widely recognized as the father of modern management. Among his numerous influential ideas, three are particularly relevant to the objectives of this study and therefore serve as its conceptual foundation. First, effective management enables a group of individuals, who would otherwise constitute an uncoordinated workforce, to achieve common organizational objectives. Second, as a logical extension of this proposition, employee management should rely not on coercion and rigid control

²⁰ Друкер П. Виклики для менеджменту XXI століття. Київ : КМ-БУКС, 2020. 320 с.

but on motivation as the primary mechanism for directing employee behaviour. Third, intrinsic motivation and self-control are more effective than externally imposed incentives, making it essential to create organizational conditions in which employees become personally committed to achieving high levels of performance. These principles were founded upon the theoretical contributions of earlier scholars and subsequently stimulated the further evolution of motivation theory in response to changing economic, technological, and social conditions. To illustrate this evolutionary process, the following discussion briefly examines the principal motivational theories, which may conventionally be classified into content theories, process theories, and contemporary approaches.

The content theories of motivation, most notably those developed by Abraham Maslow, Frederick Herzberg, and David McClelland, are fundamentally based on the analysis of individuals' internal needs that stimulate work-related behaviour. Despite their historical origins, these theories continue to retain considerable practical relevance because contemporary employee motivation systems remain largely grounded in the identification and satisfaction of employee needs. The specific configuration of these needs varies according to individual preferences and the combined influence of numerous internal and external factors.

The essence of Abraham Maslow's²¹ hierarchy of needs theory is well established in the academic literature; therefore, attention is focused here on its practical implications for industrial enterprises. Its principal advantage lies in providing a conceptual basis for designing an integrated employee motivation system through the establishment of competitive compensation, the provision of safe working conditions, the development of a strong corporate culture, opportunities for career advancement, and comprehensive professional learning and development programmes. Although the theory continues to be criticized, particularly regarding the presumed sequential satisfaction of human needs, these limitations can be substantially mitigated through the personalization of motivational practices, an approach increasingly supported by the digitalization of human resource management systems.

The practical application of Frederick Herzberg's²² two-factor theory requires the implementation of measures in two successive stages. Initially, organizations should eliminate the factors that generate employee dissatisfaction, including inadequate compensation, unfavorable working conditions, and insufficient social benefits. Subsequently, managerial efforts should focus on strengthening intrinsic motivation. A major advantage of this approach lies in its emphasis on intrinsic motivational drivers, which, as noted above, generally produce more sustainable and effective behavioural outcomes than external incentives. Nevertheless, its practical implementation remains constrained by individual differences in employees' perceptions of hygiene and motivational factors and by the varying influence these factors exert on job satisfaction.

²¹ Maslow A. A theory of human motivation. *Psychological Review*. 1943. Vol. 50. №4, pp. 370–396.

²² Herzberg F. One more time: how do you motivate employees Harvard Business Review Press, 2008. 280 p.

The theory developed by David McClelland²³ differs from earlier approaches by conceptualizing motivation as a dynamic rather than static phenomenon, evolving in accordance with the changing priorities that emerge throughout an employee's professional career. Consequently, unlike the previously discussed theories, this approach treats individual differences as a strategic advantage rather than a limitation. From the perspective of industrial enterprises, its practical application involves the use of psychological assessment methods for employee selection, the development of personalized career advancement programmes, and the establishment of talent pools for succession planning. However, the widespread psychological distress experienced by many Ukrainians as a consequence of the ongoing war significantly reduces the reliability and predictive validity of psychological assessment procedures.

The complementary nature of these content theories provides a solid foundation for their integrated application in designing employee motivation systems that simultaneously address appropriate working conditions, employee needs, and the personalization of motivational practices in accordance with individual aspirations and organizational objectives.

As with the content theories, only the principal process theories of motivation are considered here because they are united by a common conceptual perspective. Unlike content theories, which focus primarily on identifying human needs, process theories examine the mechanisms through which employees make decisions and regulate their behaviour in the course of their work activities.

Within industrial enterprises, the practical implications of Victor Vroom's²⁴ expectancy theory are reflected in the establishment of transparent performance evaluation criteria and the design of compensation systems in which bonuses and individual rewards are explicitly linked to employee performance. According to John Stacey Adams²⁵ equity theory, employees evaluate fairness not only by comparing their own contributions with the rewards they receive but also by assessing the relationship between the contributions and rewards of other members of the organization. Consequently, effective human resource management requires transparent HR policies, the prevention of discrimination, and equal opportunities for career development.

The integration of the key propositions advanced by Victor Vroom and John Stacey Adams was subsequently embodied in the Porter–Lawler model. Without examining its conceptual structure in detail, it should be emphasized that, within industrial enterprises, the model is primarily implemented through the combination of financial and non-financial incentives based on an objective assessment of each employee's contribution, followed by the equitable distribution of organizational rewards.

Unlike the content theories, process theories of motivation are characterized by their complementary nature and their capacity to facilitate individualized managerial interventions. Despite this important advantage, their practical application becomes considerably more complex under conditions of high labour mobility and economic

²³ McClelland D. Testing for competence rather than for “intelligence”. *American Psychologist*. 1973. T. 28. №1. p. 1–14.

²⁴ Vroom V. Stochastic model of managerial careers. *Administrative Science Quarterly*. 2018. 13(1). pp. 26–46.

²⁵ Adams J. S. Inequality in social exchange. *Advanced Experimental Psychology*. 1965. 62. pp. 335–343.

instability. In such circumstances, organizations encounter increasing difficulties in accounting for the individual characteristics of each employee while simultaneously maintaining continuous monitoring of work performance, job satisfaction, and the changing influence of motivational factors.

Contemporary motivation theories build upon the conceptual foundations established by both the content and process approaches while incorporating the technological transformations associated with digitalization and the accelerated implementation of the Industry 4.0 paradigm in industrial enterprises. Among these, only the most relevant approaches are considered here.

The self-determination theory proposed by Edward Deci and Richard Ryan²⁶ provides a particularly valuable framework for understanding employee motivation in contemporary industrial organizations. Since the theory identifies autonomy, competence, and relatedness as the three fundamental psychological needs, strengthening intrinsic motivation requires expanding employee autonomy while simultaneously fostering teamwork, delegating greater responsibility, and cultivating an organizational culture based on trust and partnership. Nevertheless, the technological and organizational characteristics of industrial production impose certain constraints on the practical implementation of this approach, as it is often impossible to provide every employee with a high degree of autonomy. Furthermore, evaluating the effectiveness of intrinsic motivation remains challenging because of substantial individual differences in psychological characteristics and the influence of numerous personal, family-related, and organizational factors.

The concept of emotional intelligence developed by Daniel Goleman has become particularly relevant in today's environment, characterized by the rapid expansion of individual information spaces and continuous information flows. From a practical perspective, the application of emotional intelligence principles enhances managerial effectiveness, reduces interpersonal conflict, and strengthens employees' psychological resilience. However, its implementation is constrained by the inherent difficulty of objectively measuring emotional intelligence owing to its considerable variability across individuals.

Digitalization, particularly the growing adoption of remote work arrangements, has stimulated the emergence of the concept of digital motivation. Although this concept has already evolved into a distinct theoretical approach, it continues to develop in response to the new opportunities created by artificial intelligence technologies. Within industrial enterprises, the effectiveness of digital motivation depends directly on the enterprise's level of digital transformation and the digital competencies of its workforce. In particular, the application of gamification techniques facilitates the generation of comprehensive analytical datasets that support faster and more informed human resource management decisions. At the same time, digital motivational instruments encourage employees to engage in continuous learning, thereby strengthening their organizational commitment and long-term engagement. Nevertheless, as demonstrated in the previous chapter, the relatively limited adoption of digital technologies by Ukrainian industrial enterprises

²⁶ Deci, E., & Ryan, R. Handbook of self-determination research. Rochester, NY: University of Rochester Press, 2002. 280 p.

remains a significant barrier to the effective implementation of digital motivation practices.

A concise review of selected contemporary motivation theories and concepts demonstrates that the evolution of motivation systems closely follows the expanding application of digital technologies. Consequently, employee motivation is no longer determined solely by the level of financial incentives but, above all, by the need to satisfy employees' aspirations for autonomy, self-realization, emotional well-being, and psychological security.

The preceding analysis of the practical application of content, process, and contemporary motivation theories confirms that each of these approaches remains relevant for industrial enterprises. Their implementation, however, requires adaptation to the specific organizational characteristics of individual enterprises, a process substantially facilitated by ongoing theoretical developments. Against this background, the discussion focuses exclusively on those conceptual distinctions that best illustrate the priorities shaping contemporary motivation systems.

Olha Krushelnyska²⁷ argues that motivation is determined exclusively by an employee's desire to identify an acceptable means of satisfying personal needs. While the significance of individual needs cannot be disputed, such an interpretation largely overlooks the managerial dimension of motivation. Without purposeful managerial influence, motivational processes become inherently fragmented and incapable of ensuring the achievement of organizational objectives. In contrast, Olha Litvin²⁸ expands this perspective by incorporating not only intrinsic needs but also external motivational factors, including rewards and social influence. The combined effect of these factors is expected to satisfy employees' interests while simultaneously ensuring the level of labour productivity required by the enterprise.

The importance of achieving a synergistic effect is examined more comprehensively by Dmytro Diachkov, who argues that such an outcome can be attained through "a continuous process of interaction between management and employees"²⁹ Although interaction undoubtedly constitutes an indispensable element of motivation, it must be accompanied by a clear functional differentiation between the managing and managed subsystems, together with an appropriate managerial influence. This aspect is further emphasized by Yevhen Kuzmin³⁰, who conceptualizes motivation as a specific managerial function directed simultaneously toward both the managing and managed components of the organizational system. A more comprehensive interpretation is proposed by Anatolii Kolot³¹, who examines motivation from three complementary

²⁷ Крушельницька, О. В., Мельничук Д. П. Управління персоналом. Київ: Кондор. 2007. 428 с.

²⁸ Літвін О. Г., Турло Н. П. Сучасні теорії мотивації праці та їх застосування в Україні. *Вчені записки ТНУ імені В. І. Вернадського*. 2025. №1. С. 28–33.

²⁹ Дячков Д. В., Безніщенко А. В., Сисюк М. О. Мотивація персоналу як стратегічний інструмент управління підприємством в умовах сучасних організаційних трансформацій. *Вісник ПДАУ*. 2025. Вип. 4. С. 9–15.

³⁰ Кузьмін О. С., Бодарецька О. М. Взаємозв'язок понять «мотивація» та «мотивування» у системі мотивування персоналу підприємств. *Бізнес Інформ*. 2015. № 1. С. 347–352.

³¹ Колот А. М., Цимбалюк С. О. Мотиваційний менеджмент. Київ : КНЕУ, 2014. 479 с.

perspectives: the employee's psychological state, behavioural choice within the labour process, and managerial activities intended to harmonize individual and organizational interests.

The established logical relationship demonstrates that contemporary approaches continue to rely upon the theoretical foundations of classical motivation theories, many of whose fundamental principles retain their relevance because of the specific characteristics of industrial enterprises. Consequently, it is difficult to identify a universally applicable approach to employee motivation. This can largely be attributed to the substantial influence of contextual factors that continuously necessitate the refinement of motivational systems.

Viktor Zaitsev³² attempted to identify the principal factors influencing employee motivation within industrial enterprises by classifying them into internal and external categories. However, the proposed framework does not adequately incorporate determinants associated with employees' psychological characteristics, professional competencies, personal commitment, or the effectiveness of managerial influence. As a result, the identified factors remain highly generalized and lack any prioritization, making the framework suitable primarily for a broad conceptual understanding of motivation rather than for designing effective motivation systems within specific industrial enterprises.

The position advanced in this study differs substantially. Building upon the previously established principles governing the practical application of motivation theories in industrial enterprises, the subsequent analysis focuses on the transformation of enterprise motivation systems under the predominant influence of two major contemporary factors: the ongoing military conflict and the implementation of the Industry 4.0 paradigm. As an empirical basis for this analysis, statistical data on the average monthly wage level are employed (Figure 3).

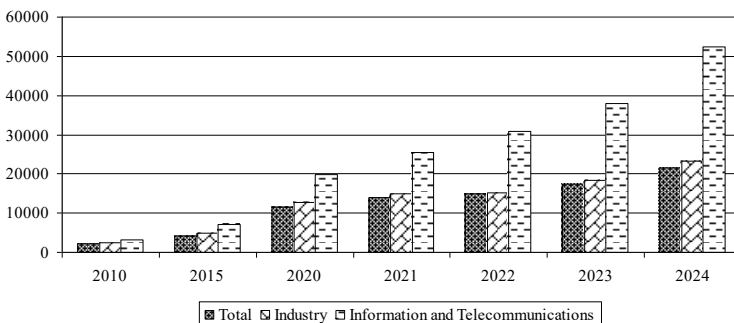


Fig. 3. Dynamics of Average Monthly Wages (UAH) by Selected Types of Economic Activity, developed by the authors based on³³

³² Зайцев В. С. Основні напрями удосконалення мотивації праці робітників промислових підприємств. *Вісник економічної науки України*. 2018. №1. С. 29–35.

³³ Статистичні дані. Державна служба статистики. URL : <https://stat.gov.ua> (дата звернення 26.06.2026)

Several important observations can be derived from the graphical representation. First, the average wage in the industrial sector remains only slightly higher than the economy-wide average, while the relationship between these indicators has remained relatively stable over time. Second, employment in other sectors of the economy has become increasingly attractive for employees, with the information and telecommunications sector demonstrating the strongest competitive position in terms of remuneration. Third, the observed positive wage dynamics should be interpreted in the context of persistently high inflation and successive increases in the statutory minimum wage.

Although wages represent only one of the motivational instruments available to employers, both their absolute level and growth dynamics exert a decisive influence on employees' labour market behaviour. In this context, it is important to note that the average wage at industrial enterprises in Poland amounted to approximately UAH 80,700 in 2024, exceeding the corresponding Ukrainian indicator by approximately 3.5 times. Under conditions of high labour mobility, Ukrainian enterprises must therefore design their motivation systems with the recognition that competition for qualified employees extends well beyond the boundaries of the domestic labour market.

The statistical evidence provides an important empirical basis for clarifying the influence of the two principal factors shaping the evolution of motivation systems within industrial enterprises. Despite its prolonged duration, the active phase of the military conflict may still be regarded as a predominantly short-term factor. Nevertheless, it has fundamentally transformed employee motivation systems in several key respects:

- a shift in motivational priorities, reflected in employees' increased emphasis on job security, timely wage payments, safe working conditions, and access to psychological support;
- under conditions of limited financial resources that restrict rapid wage growth, considerably greater attention has been devoted to non-financial motivation. Consequently, practices such as the public recognition of professional achievements, employee participation in managerial decision-making, and the strengthening of teamwork have become increasingly widespread;
- the expansion of employers' social responsibility through the provision of financial assistance, support for the families of mobilized employees, medical services, and psychological assistance during periods of crisis;
- labour market instability has increased the importance of accelerating the adaptation of newly recruited employees, implementing retention measures aimed at strengthening organizational commitment, and introducing personalized motivational policies based on flexible compensation packages that take into account employees' family circumstances and security-related needs;
- the strengthening of intrinsic motivation by emphasizing the significance of each employee's contribution to maintaining the country's defence capability, supporting post-war economic recovery, and reinforcing national patriotism together with broader social responsibility.

The above developments should not be regarded as an exhaustive list but rather as the principal trends that have emerged across the majority of Ukrainian industrial enterprises. Overall, the experience of the past four years indicates that employee motivation systems have progressively acquired the characteristics of crisis-oriented

management systems. Whereas the primary objective had previously been to enhance labour productivity, motivation systems are now increasingly directed toward workforce stabilization, ensuring employee safety, and strengthening psychological resilience.

Chapter 2 provided a general characterization of the influence of Industry 4.0 on human resource management in industrial enterprises. Since the motivation system occupies a lower level within the hierarchical structure of the human resource management system, it is necessary to specify this influence from a long-term perspective. The principal transformation trends include the following:

- a shift in motivational priorities, whereby non-financial incentives acquire greater importance, particularly continuous learning, the development of digital competencies, increased autonomy in performing professional tasks, and flexible working arrangements;
- the gradual expansion of automated and robotic operations within industrial production, resulting in a transition from predominantly physical labour to knowledge-intensive work focused on innovation and problem-solving. Consequently, greater emphasis must be placed on strengthening intrinsic motivation, including the promotion of professional self-realization and creative initiative;
- the application of digital tools to facilitate the personalization of motivation systems through individualized career paths, professional development programmes, customized employee benefits, improved performance evaluation, and more timely, evidence-based managerial decision-making;
- the implementation of gamification mechanisms, including point-based reward systems, employee rankings, virtual badges, and similar digital incentives, to strengthen organizational commitment and encourage active participation in achieving collective organizational objectives;
- a gradual transition from fixed remuneration schemes toward performance-based reward systems that recognize employees' contributions, competencies, initiative, and continuous professional development.

The influence of Industry 4.0 during the past five years can be interpreted from two complementary perspectives. First, in the short term, the impact of the full-scale war has become substantially more significant, thereby assigning higher priority to the previously discussed crisis-induced transformations of employee motivation systems. Second, the successful implementation of organizational changes required for adaptation to wartime conditions has been facilitated by the experience accumulated through the earlier adoption of Industry 4.0 principles, particularly in the field of digital human resource management. These conclusions are summarized graphically in Figure 4.

The foregoing analysis demonstrates that contemporary employee motivation systems are being transformed under the simultaneous influence of numerous interrelated factors.

The complexity of this transformation stems not only from the concurrent operation of these factors but also from the continuously changing intensity of their influence. This once again confirms the critical importance of maintaining flexibility within the human resource management system as a whole, enabling industrial enterprises to respond effectively to both short-term disruptions and long-term structural transformations.

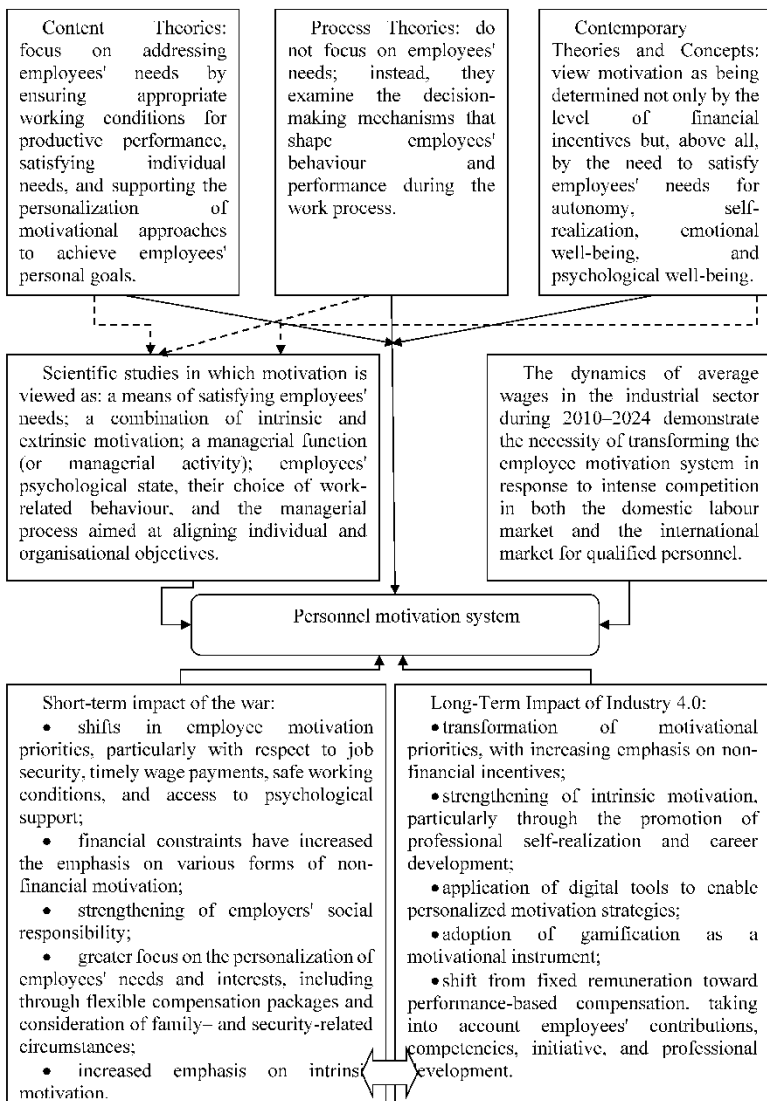


Fig. 4. Key aspects of the formation and development of the motivation system at industrial enterprises, *developed by the authors*

4. Risks and emerging opportunities associated with employing military veterans

The Russian–Ukrainian war represents the longest and most extensive security challenge in the history of independent Ukraine and has been shaping the country's development trajectory for more than a decade. The beginning of the conflict is generally associated with February 2014, when the Russian Federation occupied the Autonomous Republic of Crimea and the city of Sevastopol and initiated armed aggression in eastern Ukraine. On 24 February 2022, the conflict escalated into a full-scale invasion, fundamentally altering its nature, the scale of destruction, and the magnitude of its impact on virtually every sphere of public life. As of 2026, the war has continued for more than twelve years, including over four years of full-scale military aggression, making it the dominant factor influencing Ukraine's socio-economic development.

Unlike most economic or political crises, the Russian–Ukrainian war has generated a multidimensional and systemic impact. It has not only resulted in substantial human losses and the destruction of productive capacity but has also become a catalyst for profound structural transformations that will continue to shape Ukraine's development throughout the post-war recovery period. The key dimensions of the war's impact can be briefly summarised as follows.

From a demographic perspective, the consequences include significant human losses, large-scale forced migration, a decline in the economically active population, widening regional disparities, and an acceleration of population ageing. Reliable demographic statistics remain unavailable because the war is ongoing. However, according to expert estimates, Ukraine's population had declined to approximately 29 million by June 2026, compared with the officially recorded 41.13 million as of 1 January 2022³⁴. Internal displacement, long-term external migration, and the mobilisation of a substantial proportion of the working-age population have profoundly transformed the national labour market, resulting in a persistent shortage of qualified personnel across most sectors of the economy.

The economic consequences of the war are reflected in the destruction of industrial, transport, and energy infrastructure, the contraction of production capacity, the loss of part of the country's natural resource potential, declining investment activity, disruptions to supply chains, the reorientation of foreign trade, and the need for a substantial increase in public expenditure on defence and national security. According to analysts at the Kyiv School of Economics, as of February 2026, Ukraine's cumulative losses since February 2022 were estimated at approximately USD 1.7 trillion³⁵. At the same time, the war has accelerated structural economic transformation, stimulated the development of the defence-industrial sector, intensified the digitalisation of public administration, expanded international financial assistance, and strengthened Ukraine's integration into the European economic area.

³⁴ Статистичні дані. Державна служба статистики. URL : <https://stat.gov.ua> (дата звернення 26.06.2026)

³⁵ Звіт про непрямі фінансові втрати економіки внаслідок військової агресії Росії проти України до кінця 2026 року. Київська школа економіки. Київ : Київська школа економіки, 2026. 32 с.

The social sphere has also undergone profound transformation, including changes in living standards, increasing social inequality, the expansion of socially vulnerable population groups, the widespread prevalence of psychological trauma, and the need for large-scale adaptation of the social protection system³⁶. Simultaneously, the war has fundamentally reshaped public consciousness by strengthening the consolidation of the Ukrainian political nation, reinforcing national identity, redefining historical memory, language policy, cultural values, and the country's strategic foreign policy priorities. Moreover, the process of European integration has intensified significantly, driving institutional reforms across virtually all areas of public policy.

Within the field of human resource management, the war has become a decisive factor necessitating the revision of traditional personnel management practices. Enterprises have faced a range of unprecedented challenges, including labour shortages, employee mobilisation, the growing need for psychological support, ensuring occupational safety, adapting internal communication systems, accelerating the digitalisation of HR processes, retaining critical competencies, and developing new approaches to employee motivation. Under wartime conditions, human capital has become an unquestionably strategic resource underpinning the competitiveness and long-term resilience of industrial enterprises.

The above considerations provide a sound basis for concluding that the war has triggered substantial transformations across virtually every sphere of Ukraine's socio-economic system. However, the objective of this chapter extends beyond analysing current wartime challenges. Particular attention is devoted to those changes that have already begun to emerge and are expected to become major drivers of transformation in both the short and the long term. These changes are primarily associated with military veterans who are gradually being demobilised and reintegrated into civilian life.

Against this background, the principles of human resource management require not merely revision but comprehensive adaptation to address both the risks and the emerging opportunities associated with employing veterans. Human resource policies must therefore evolve to facilitate the effective integration of this category of employees while simultaneously enabling enterprises to utilise the valuable competencies acquired during military service.

Support for this argument can be found in the preliminary estimates presented by O. Pshyk-Kovalska³⁷, who forecasts that the end of the war may result in the demobilisation of approximately 4–5 million veterans. Considering that Ukraine currently has around 20 million people of working age, of whom approximately 10 million are officially employed, alongside 10.2 million pensioners, veterans constitute a substantial labour resource whose effective integration into the labour market will be essential for the country's post-war economic recovery, particularly within the industrial sector.

³⁶ Bazhenova, O., Varnalii, Z., Cheberyako, O., & Mykytiuk, O. (2023). Modeling human social security during war. *Neuro-Fuzzy Modeling Techniques in Economics*, 12, 111–132. <http://doi.org/10.33111/nfnte.2023.111>

³⁷ Пшик-Ковальська О. О. Виклики та перспективи соціально-професійної адаптації ветеранів в Україні: адміністративні механізми та управлінські рішення. *Економіка та суспільство*. 2025. Вип. №77. DOI: <https://doi.org/10.32782/2524-0072/2025-77-110> (дата звернення 11.07.2026)

In this context, the position advanced by N. Azmuk appears particularly convincing, namely that "...war veterans represent an important and valuable source of labour force reproduction due to their experience, qualifications, commitment to the country, ability to work effectively in teams, and strong motivation to contribute to national reconstruction"³⁸. This conclusion is further supported by the age structure of mobilised personnel, with the largest proportion belonging to the 31–40 age group (36.4%), followed by those aged 41–50 (32.9%)³⁹. Furthermore, more than 85% of mobilised personnel previously worked in blue-collar occupations, which currently experience the most acute labour shortages in Ukraine. Consequently, the issue of veterans' successful reintegration into civilian employment, particularly within industrial enterprises, has become an increasingly important research and policy priority.

Ukraine is currently implementing a nationwide mobilisation programme aimed at increasing the size of the Armed Forces to a level sufficient to maintain a defence line extending approximately 1,200 kilometres. Although the exact number of mobilised personnel remains undisclosed, the scale of mobilisation can be assessed by comparing the size of the Armed Forces before and during the full-scale war. Prior to 2022, the Armed Forces of Ukraine comprised approximately 261,000 personnel, whereas by 2026 this number had increased to around one million. These figures indicate that the overwhelming majority of those currently serving in the Armed Forces were mobilised with either limited or no previous military experience.

From the perspective of human resource management, however, a more significant issue concerns the competencies acquired during military service and the extent to which participation in military operations transforms the professional qualifications of individuals relative to their pre-war occupations. Consequently, the following analysis examines these transformations as a conceptual foundation for adapting human resource management practices, given the inevitable increase in the number of job applicants possessing combat experience.

The specific nature of military service contributes substantially to the development of new competencies. This effect is particularly pronounced under combat conditions characterised by continuous exposure to risk, rapidly changing operational environments, severe time constraints, and limited resources. Simultaneously, these conditions foster exceptional levels of adaptability, discipline, and resilience under pressure. According to analytical evidence⁴⁰, 67.4% of veterans identified first aid and emergency medical assistance as the most practically applicable competencies acquired during military service for their subsequent civilian employment.

One of the most valuable competencies developed by veterans is the ability to operate effectively under conditions of uncertainty. Unlike conventional industrial environments, combat situations are characterised by high operational dynamics, incomplete

³⁸ Азьмук Н. А. Соціально-економічна та освітня реінтеграція ветеранів до ринку праці: український контекст. *Вісник економічної науки України*. 2023. №2(45). С. 117–122.

³⁹ Чиріна А. Ю., Вітовецька С. В., Кононенко В. А. Особливості адаптації ветеранів та ветоеранок війни до ринку праці в Україні. *Наукові перспективи*. 2024. №12. С. 1416–1425.

⁴⁰ Працевлаштування ветеранів та ветеранок: бар'єри та адаптаційні виклики (квітень – травень 2025 р.). Мінветеранів. URL : https://veteranfund.com.ua/wp-content/uploads/2025/06/Pratsevlashtuvannia_veteraniv_ta_veteranok_bariery_ta_adaptatsiyni.pdf (дата звернення 11.07.2026)

information, and elevated levels of risk. Such conditions cultivate the ability to analyse complex situations rapidly, assess risks, establish priorities, and make well-informed managerial decisions within extremely limited timeframes. For industrial enterprises, these competencies are particularly valuable in the context of economic uncertainty, digital transformation, and intensifying market competition.

Military service also promotes a high degree of personal responsibility and professional discipline. The execution of military tasks requires strict compliance with established procedures, timely implementation of orders, efficient utilisation of available resources, and personal accountability for operational outcomes. Consequently, veterans typically demonstrate high levels of organisation, punctuality, self-discipline, and a strong commitment to achieving defined objectives.

Another significant competitive advantage of veterans lies in their advanced teamwork competencies. During military service, operational effectiveness depends directly on cooperation among service members, the ability to coordinate collective actions, maintain effective communication, and allocate responsibilities efficiently within teams. According to the survey findings⁴¹, 34.6% of veterans identified teamwork as one of the principal competencies acquired during military service. In their opinion, military experience substantially enhances cooperation, mutual trust, effective communication, and constructive conflict resolution skills.

Leadership competencies also constitute an important component of veterans' human capital. A considerable proportion of military personnel acquire practical experience in leading military units, planning operations, organising task execution, coordinating subordinate teams, managing resources, and motivating personnel. Unlike traditional management models, military leadership develops under conditions involving direct responsibility for human life, thereby strengthening the ability to make rapid decisions, assume responsibility, and maintain effective team performance during crisis situations.

Military service likewise facilitates the development of organisational competencies associated with activity planning, resource coordination, logistics management, material and technical support, procedural compliance, and operational control. Within industrial enterprises, these competencies are directly applicable to production management, project implementation, supply chain coordination, and ensuring business continuity.

Analytical competencies represent another important outcome of military service. Combat operations require continuous processing of large volumes of information, threat assessment, forecasting potential scenarios, and selecting the most appropriate courses of action. These competencies closely correspond to the requirements imposed on contemporary managers operating in environments characterised by rapid technological change and digital transformation.

In recent years, military personnel have also acquired an increasingly broad range of digital competencies. The extensive use of unmanned aerial systems, geographic information systems, digital command-and-control platforms, secure communication technologies, operational planning software, situational awareness systems, and other advanced digital technologies has substantially enhanced digital literacy among military personnel. Furthermore, many veterans have gained practical experience in operating

⁴¹ Працевлаштування ветеранів та ветеранок: бар'єри та адаптаційні виклики (квітень – травень 2025 р.). Мінветеранів. URL : https://veteranfund.com.ua/wp-content/uploads/2025/06/Pratsevlashtuvannia_veteraniv_ta_veteranok_bariery_ta_adaptatsiyni.pdf (дата звернення 11.07.2026)

robotic systems, analysing digital data, using satellite navigation technologies, digital mapping software, and applying basic cybersecurity principles.

Equally important are the psychological competencies developed through military service. These include emotional resilience, self-control, the ability to perform effectively under prolonged psychological pressure, rapid recovery following crisis situations, a strong commitment to safety, and readiness to respond appropriately in emergency situations. Such competencies significantly enhance employees' ability to maintain productivity under challenging organisational conditions.

The above analysis demonstrates that military service facilitates the development of a broad spectrum of transferable and occupation-specific competencies that closely correspond to the expectations of contemporary employers and can be effectively utilised across various sectors of the economy. Among the most valuable are strategic and critical thinking, leadership, discipline, accountability, decision-making under uncertainty, risk management, teamwork, digital competencies, logistics and project management skills, organisational capabilities, resilience, and adaptability to continuous change. Collectively, these competencies constitute a substantial component of veterans' human capital and provide enterprises with opportunities to strengthen organisational competitiveness while contributing to Ukraine's post-war economic reconstruction and industrial modernisation.

As emphasised in the preceding discussion, the newly acquired competencies developed during military service partially replace those previously formed through an individual's civilian professional experience prior to mobilisation. This transformation requires further examination in order to avoid a fragmented approach to adapting human resource management systems and to provide a comprehensive understanding of the changes affecting veterans' professional capabilities.

A distinctive feature of contemporary military training is its exceptionally high intensity. The standard training programme lasts 51 days, including 42 days devoted to basic military instruction and integrated tactical exercises. Within this relatively short period, mobilised personnel undergo accelerated learning, acquire substantial amounts of new knowledge, develop practical skills, and learn to perform professional tasks effectively under conditions of persistent uncertainty. Such intensive training significantly accelerates competency development while simultaneously reshaping the individual's professional profile.

At the same time, prolonged absence from civilian employment may result in the partial deterioration of occupation-specific knowledge and skills owing to technological progress, changes in production processes, software upgrades, amendments to regulatory requirements, and the continuous evolution of professional standards. According to sociological surveys, 14% of veterans themselves acknowledge this challenge, recognising the obsolescence of previously acquired knowledge and a decline in the relevance of their pre-war professional qualifications⁴². Consequently, following demobilisation, many veterans may require professional adaptation programmes, continuing professional development, or retraining to restore occupation-specific competencies. Nevertheless, the transferable competencies acquired during military

⁴² Працевлаштування ветеранів та ветеранок: бар'єри та адаптаційні виклики (квітень – травень 2025 р.). Мінветеранів. URL : https://veteranfund.com.ua/wp-content/uploads/2025/06/Pratsevlashtuvannia_veteraniv_ta_veteranok_bariery_ta_adaptatsiyni.pdf (дата звернення 11.07.2026)

service frequently compensate for these knowledge gaps and create favourable conditions for the rapid restoration of professional effectiveness.

Particular attention should also be given to the psychological dimension of professional transformation. Participation in military operations often reshapes an individual's system of personal values, attitudes towards work, responsibility, time management, and interpersonal relationships within organisations. Many veterans demonstrate increased personal maturity, independence, accountability, result orientation, and the capacity to perform effectively under crisis conditions. At the same time, the transition back to civilian employment may require a period of psychological adjustment. Consequently, employers should establish inclusive workplaces, provide managerial support, implement mentoring programmes, and, where appropriate, facilitate access to psychological support services.

It is equally important to recognise that adaptation is required not only from veterans themselves but also from their new organisational environment, including managers and co-workers. Veterans often return to civilian employment with transformed personal values, heightened perceptions of social justice, and perspectives on future planning that have been fundamentally influenced by their wartime experiences. These changes necessitate mutual adaptation between veterans and their workplace in order to ensure effective communication, collaboration, and organisational integration.

From the perspective of human capital theory, mobilisation should be regarded as a distinctive stage in an employee's professional development during which new competencies are formed that possess considerable value for contemporary organisations. Although military service temporarily interrupts civilian career progression, it simultaneously facilitates the development of transferable competencies that enhance adaptability, managerial potential, resilience, learning capacity, teamwork, and decision-making under conditions of uncertainty.

Accordingly, the mobilisation of individuals who had no prior military training before the war should not be viewed solely as a disruption of professional careers or as a loss of occupation-specific experience. Provided that appropriate reintegration and professional adaptation measures are implemented following demobilisation, military service can become a powerful mechanism for human capital development, competency enhancement, and the expansion of an employee's professional potential. For human resource management systems, this implies the need to move beyond the traditional perception of veterans as a category requiring primarily social support and instead recognise them as valuable carriers of competencies capable of improving organisational performance and strengthening enterprise resilience under conditions of persistent uncertainty.

Figure 5 summarises the principal advantages and risks associated with recruiting employees from among military veterans, thereby providing a conceptual basis for adapting human resource management practices to the realities of Ukraine's post-war labour market.

The analysis indicates that the vast majority of risks associated with employing military veterans are organisational rather than individual in nature and can be substantially mitigated through the implementation of contemporary human resource management practices.

These include structured onboarding and adaptation programmes, mentoring, psychological support services, management training, the development of an inclusive organisational culture, and formal recognition of competencies acquired during military service. By contrast, the principal benefits are predominantly strategic, as they contribute

to the enhancement of human capital, strengthen organisational resilience, and generate sustainable competitive advantages for enterprises.

Consequently, it can be argued that the effectiveness of veteran recruitment depends less on the characteristics of the candidates themselves than on an organisation's readiness to integrate their knowledge, experience, and competencies into its human resource management system.

We contend that these findings should be complemented by an analysis of the incentives and constraints experienced by veterans when seeking employment in industrial enterprises. Without considering this perspective, it is impossible to develop the most effective portfolio of human resource management practices (Figure 6). In developing our conceptual framework, we considered the findings of analytical studies specifically addressing veterans' challenges in the labour market.

According to these studies, the principal barriers include "limited career prospects (30%), the availability of formal employment (25%), qualification mismatches (11%), prejudicial attitudes from colleagues related to veteran status (11%), and discrimination on the part of employers (10%)"⁴³.

Another study identifies low wages as the dominant barrier to employment, with 74% of surveyed veterans highlighting inadequate remuneration as their primary concern⁴⁴. We attribute these differences in empirical findings to the rapidly changing conditions of the labour market, as well as to the diversity of veterans' individual expectations, professional backgrounds, and career priorities.

Our approach differs from previous studies by examining not only the constraints faced by veterans but also the opportunities available to them. Such a perspective emphasises the need to achieve a balance between the interests of industrial enterprises and those of veteran employees. This balanced approach provides a more comprehensive foundation for designing adaptive human resource management systems capable of simultaneously supporting organisational competitiveness and facilitating the successful professional reintegration of military veterans.

It is evident that no analysis can fully capture the diversity of individual circumstances characterising military veterans. Nevertheless, it can be concluded that the employment of veterans in industrial enterprises represents a mutually beneficial process that promotes the effective utilisation of human capital while contributing to Ukraine's post-war economic recovery. For veterans, the principal benefits include the restoration of professional careers, the opportunity to apply competencies acquired during military service, greater financial stability, and enhanced prospects for long-term career development.

⁴³ Реінтеграція ветеранів в Україні: аналітичний бриф (травень 2026). Міжнародна організація з міграції. URL: <https://reliefweb.int/report/ukraine/ukraine-reintegraciya-veteraniv-v-ukraini-sukupni-vrazilivosti-ta-dostup-do-pidtrimki-sered-veteraniv-traven-2026-roku-uk> (дата звернення 11.07.2026)

⁴⁴ Сингаївська І., Бузова В. Особливості реінтеграції ветеранів війни в професійну діяльність. *Вчені записки Університету «КРОК»*. 2025. №4(80). С. 371–379.

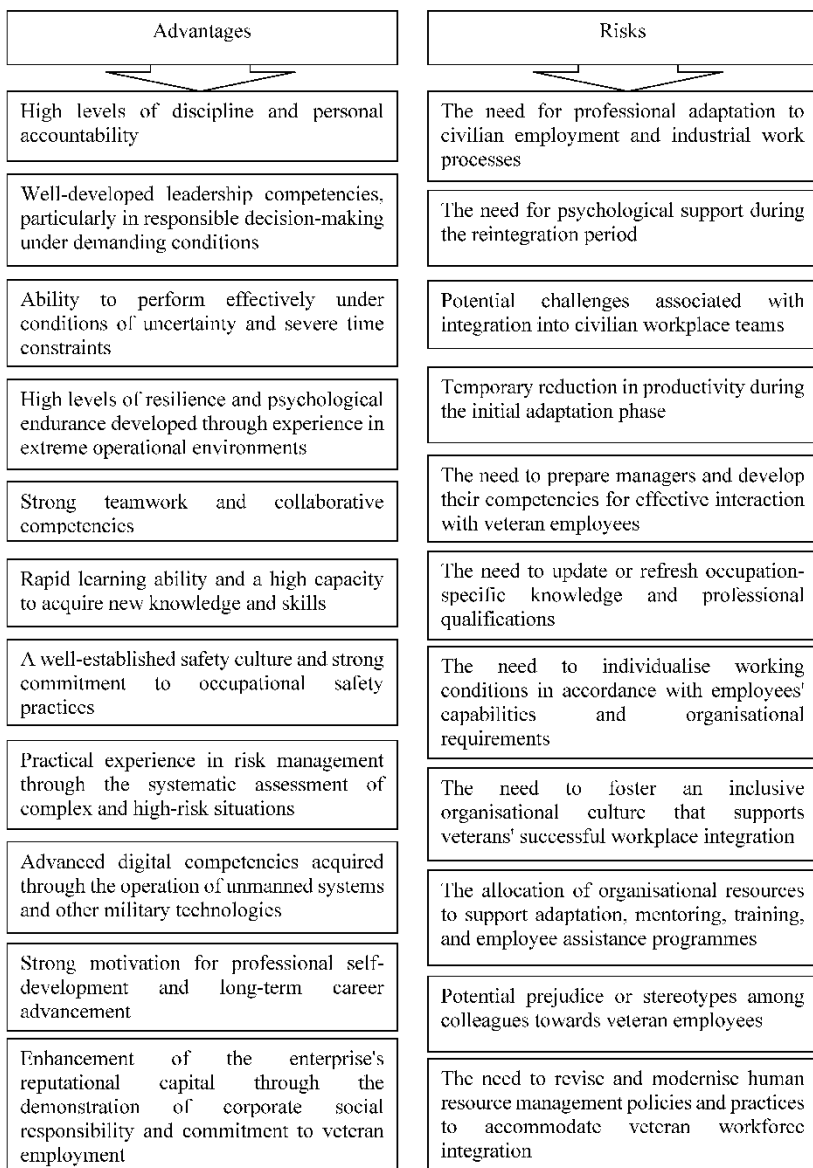


Fig. 5. Advantages and risks associated with the employment of military veterans, developed by the authors

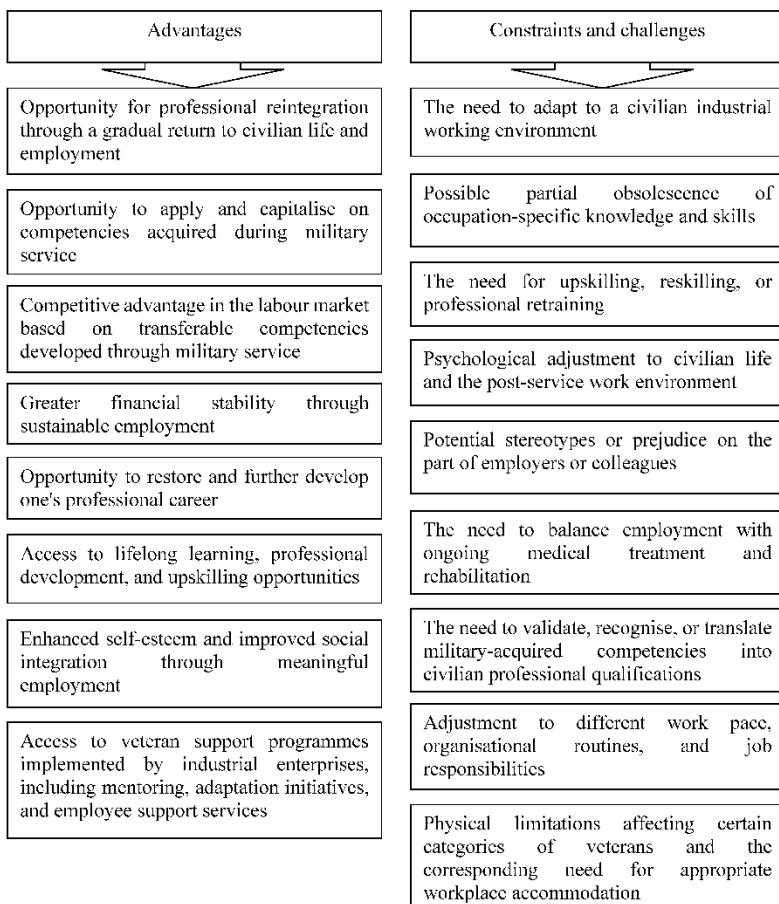


Fig. 6. Advantages and constraints encountered by military veterans during employment in industrial enterprises, developed by the authors

At the same time, most of the constraints associated with veteran employment are adaptive rather than structural in nature and can be substantially mitigated through the implementation of professional adaptation programmes, mentoring, lifelong learning initiatives, recognition of competencies acquired through non-formal learning, the creation of accessible and inclusive working environments, and the development of an inclusive organisational culture. Under such conditions, military experience is transformed from a potential employment challenge into a valuable source of professional competencies that strengthens veterans' competitiveness within the contemporary labour market.

In conclusion, we argue that preparation for the large-scale integration of veterans into the civilian workforce must begin well in advance. The risks, opportunities, emerging challenges, and constraining factors identified throughout this chapter should already be incorporated into human resource management policies, as it will be practical rather than merely declarative measures that ultimately influence veterans' employment decisions following demobilisation. Accordingly, proposed human resource management practices should be piloted using the experience of those veterans who are currently returning to civilian employment.

As of June 2026, the principal legal basis for demobilisation remains the health status of military personnel, with health-related discharge accounting for approximately 50.5% of all demobilised service members. This circumstance should be regarded as a fundamental consideration in the transformation of human resource management systems. It underscores the necessity for enterprises to develop adaptive recruitment, onboarding, workplace accommodation, occupational health, and employee support mechanisms capable of addressing the specific needs of veterans while enabling organisations to realise the full value of their human capital in the post-war economy.

5. International experience and Ukrainian practice of integrating veterans into the operations of industrial enterprises

The experience of countries that have been involved in military conflicts for extended periods or maintain large professional armed forces demonstrates that the effective integration of veterans into the civilian labour market is one of the key determinants of a country's economic resilience. In this context, the emphasis has gradually shifted from policies of social support for veterans towards recognising them as carriers of human capital capable of generating long-term competitive advantages for enterprises. Despite differences in national models, international experience reveals several common patterns that can be successfully adapted by Ukrainian industrial enterprises.

The United States has developed one of the most advanced models of veteran reintegration. It is based on an early transition system that prepares military personnel for civilian life before discharge. The mandatory Transition Assistance Program (TAP) begins prior to separation from military service and includes career counselling, competency assessment, career planning assistance, job-search training, résumé preparation, and interaction with prospective employers⁴⁵. An important feature of the American model is the active involvement of private businesses, which are regarded as equal partners in the veteran reintegration process, as well as veterans' priority access to public employment services.

The Canadian model is characterised by a high degree of individualisation. Its core element is the Individual Transition Plan, which is developed for each service member before demobilisation⁴⁶. The plan covers professional development, health status,

⁴⁵ Огляд міжнародних практик у сфері реінтеграції ветеранів. Міркування щодо воєнного та повоєнного контексту України. ПРООН. 2023. 19 вересня. URL: <https://www.undp.org/uk/ukraine/publications>. (дата звернення 11.07.2026)

⁴⁶ Russell L. E., Cohen A. J., Chrzas S., та ін. Implementing a social needs screening and referral program among veterans: Assessing circumstances & offering resources for needs (ACORN). *Journal of General Internal Medicine*. 2023. Vol. 38. P. 2906–2913. DOI: <https://doi.org/10.1007/s11606-023-08181-9> (дата звернення 11.07.2026)

psychological support, educational needs, and future employment opportunities. Veterans with service-related injuries or long-term health impairments receive additional support through specialised interagency transition centres that ensure continuity of rehabilitation and employment assistance.

In the United Kingdom, the system is built upon close cooperation between the government and employers. Programmes such as the Career Transition Partnership, Defence Transition Services, and the Veterans Industry Engagement Programme are designed not only to prepare veterans for civilian employment but also to equip employers with the knowledge and skills required to work effectively with this category of employees⁴⁷. Considerable attention is devoted to creating veteran-friendly workplaces, developing mentoring programmes, training managers, implementing corporate adaptation policies, and supporting veterans' long-term professional development.

Australia has established one of the most proactive models of cooperation between the state and the business sector. Its principal initiatives include the Defence Force Transition Program and the Veteran Employment Program, complemented by the Veteran Employment Commitment initiative. Employers implementing veteran employment programmes receive official recognition as veteran-friendly organisations⁴⁸. Australian practice demonstrates the effectiveness of corporate veteran networks, mentoring schemes, adapted recruitment procedures, and the formal recognition of military-acquired competencies during personnel selection.

The French approach places particular emphasis on the formal recognition of competencies acquired during military service. Through the Validation des Acquis de l'Expérience (VAE) system, military experience and competencies may be officially recognised as civilian professional qualifications. In parallel, the public employment service Défense Mobilité provides career guidance, cooperates with employers, and matches veterans with suitable employment opportunities based on their competency profiles.

Israel represents a distinctive case. Although its model differs considerably due to the country's system of compulsory military service, it demonstrates the effective utilisation of military-acquired competencies within high-technology industries. Many enterprises regard military service as a valuable advantage when recruiting employees, particularly in information technology, cybersecurity, logistics, engineering, and project management. Consequently, military service is perceived not as an interruption of a professional career but rather as an important stage in the development of human capital.

A comparative analysis makes it possible to identify several common characteristics shared by the most successful veteran integration models. First, nearly all countries begin preparing military personnel for civilian employment before demobilisation. Second,

⁴⁷ Іновацийні підходи до працевлаштування та перекваліфікації ветеранів: світовий досвід і перспективи для України (травень 2024). Український ветеранський фонд Міністерства у справах ветеранів. URL : <https://veteranfund.com.ua/innovative-approaches-to-employment-and-retraining-of-veterans/> (дата звернення 12.07.2026)

⁴⁸ Wiese T. L. Analyzing a Decade of Warrior Well-Being: Longitudinal Trends and Implications for U.S. Veteran Support From the Wounded Warrior Project Annual Survey (2014–2025). *Military Medicine*. 2026. Vol. 191, Issue 1–2. P. e330–e337. DOI: <https://doi.org/10.1093/milmed/usaf396> (дата звернення 12.07.2026)

support continues after employment and extends throughout the professional adaptation period. Third, employers act as active participants in the reintegration process rather than merely as end users of labour resources. Fourth, military-acquired competencies are formally recognised as an integral component of human capital, significantly reducing the time required for veterans to adapt to civilian employment. Finally, considerable emphasis is placed on managerial training, the development of inclusive corporate cultures, and the implementation of structured mentoring systems.

The full-scale war has fundamentally transformed the approaches adopted by Ukrainian enterprises to personnel policy development. While the initial stage was primarily characterised by efforts to preserve the existing workforce and replace mobilised employees, since 2024–2025 increasing attention has been devoted to preparing enterprises for the large-scale reintegration of veterans into industrial operations. Consequently, current practice is gradually evolving from isolated social initiatives towards the establishment of comprehensive corporate veteran policies.

The most systematic practices have emerged within the defence-industrial sector, where employees' military experience is directly linked to production activities. At the initiative of the Ministry for Strategic Industries of Ukraine, programmes have been introduced to prepare employers for working with veterans, specialised training sessions are being delivered for HR departments, and defence manufacturers are implementing the principles of veteran-friendly business practices⁴⁹. The primary objective of these initiatives is not only to facilitate the employment of demobilised service personnel but also to create an organisational environment capable of supporting their long-term professional integration.

An analysis of the practices adopted by Ukrainian enterprises makes it possible to identify several principal directions of veteran integration.

The first direction involves the transformation of personnel policy. Enterprises are gradually abandoning the traditional approach under which veterans are viewed solely as employees requiring social support⁵⁰. Instead, a competency-based assessment model is being introduced, recognising military service as a source of leadership, organisational, managerial, logistical, and digital competencies. Consequently, during recruitment, increasing emphasis is placed on transferable competencies acquired through military service rather than exclusively on previous civilian work experience.

The second direction concerns the implementation of professional adaptation programmes. At leading industrial enterprises, the employment of veterans is no longer limited to signing an employment contract. Instead, organisations develop individual adaptation plans, appoint mentors, provide gradual familiarisation with production processes, progressively increase workload, and continuously monitor employees' professional integration.

⁴⁹ Войтовська Я. Посібник для роботодавців з працевлаштування ветеранів, у тому числі з інвалідністю в аграрній сфері. URL https://veteran-reintegration.in.ua/wp-content/uploads/2026/01/alltogether_guide_agro_preview.pdf (дата звернення 12.07.2026)

⁵⁰ Вербицька А. В. Роль бізнесу як каталізатора розвитку соціального підприємництва в процесі реінтеграції військовослужбовців, ветеранів та членів їх сімей. *Науковий вісник Ужгородського національного університету*. 2023. Вип. 49. С. 7–10. DOI: <https://doi.org/10.32782/2413-9971/2023-49-1> (дата звернення 12.07.2026)

The third direction is the widespread introduction of mentoring programmes. Each veteran is assigned an experienced employee or immediate supervisor who provides professional guidance, facilitates adaptation to the corporate culture, familiarises the employee with production procedures and internal communication systems, and supports successful workplace integration⁵¹. Such an approach reduces the duration of the adaptation period and minimises the risk of early employee turnover.

The fourth direction focuses on managerial training at all organisational levels. Ukrainian practice demonstrates that adaptation is required not only for veterans but also for enterprise managers. Consequently, organisations increasingly provide training programmes covering communication with veterans, management of mixed teams, discrimination prevention, conflict management, and the creation of inclusive production environments.

The fifth direction involves the development of corporate psychological support systems. Enterprises are progressively incorporating psychological assistance into their personnel management systems by providing counselling services, training managers in psychologically safe communication practices, organising awareness activities for employees, and establishing mechanisms for the early identification and resolution of adaptation-related difficulties.

The sixth direction concerns the development of barrier-free production environments. Given the considerable proportion of veterans who have sustained injuries or acquired long-term functional limitations, enterprises are actively adapting production infrastructure, modernising workplaces, improving occupational health and safety standards, and ensuring accessibility throughout production facilities⁵². Simultaneously, flexible working arrangements are becoming increasingly common for employees who continue to undergo medical treatment or rehabilitation.

Another important direction is the development of a veteran-oriented corporate culture⁵³. Enterprises are gradually introducing internal standards governing interaction with veterans, conducting awareness campaigns aimed at eliminating stereotypes, organising corporate initiatives recognising the contribution of Ukraine's Defenders, and establishing support mechanisms for employees returning from military service. Such practices contribute to strengthening trust within the workforce and enhancing organisational commitment.

It should be emphasised that the Ukrainian model of veteran integration is currently at an active stage of development. At the national level, systematic programmes supporting veterans' professional reintegration have already been launched, including the

⁵¹ Гращенко І. Працевлаштування ветеранів – соціальна відповідальність кожного (держави, бізнесу та громадянського суспільства). *European scientific journal of Economic and Financial innovation*. 2025. №1 (15). С. 5–16. DOI: <http://doi.org/10.32750/2025-0101> (дата звернення 12.07.2026)

⁵² Nazarova G., Sotnikova Y., Luhova V., Klyzub O., Ivashchenko M. (2025). Research of problems and prospects of economic adaptation of military servicemen: sociological and statistical analysis. *Technology Audit and Production Reserves*, 3(4(83)), 93–99. <https://doi.org/10.15587/2706-5448.2025.329096> (дата звернення 12.07.2026)

⁵³ Постна Д. А. Забезпечення працевлаштування ветеранів війни. *Науковий вісник Ужгородського національного університету*. 2024. Вип. 86(3). С. 49–55. DOI: <https://doi.org/10.24144/2307-3322.2024.86.3.7> (дата звернення 12.07.2026)

«Veteran. Employment» State Programme Concept and initiatives promoting veteran entrepreneurship. Among their principal objectives are the development of employer standards for working with veterans, methodological guidelines for workplace adaptation, and the dissemination of best practices in corporate veteran integration.

A comparison of Ukrainian practices with the experience of NATO member states indicates that most of the fundamental components of a modern veteran integration system are already emerging in Ukraine. These include a competency-based approach to personnel selection, professional adaptation programmes, mentoring, psychological support, managerial training, the creation of barrier-free production environments, and the development of an inclusive corporate culture. At the same time, Ukraine faces a unique challenge arising from the unprecedented scale of the forthcoming demobilisation, which will require a transition from isolated corporate initiatives to the comprehensive transformation of personnel management systems across virtually all industrial enterprises.

The conducted analysis demonstrates that the vast majority of existing recommendations focus primarily on individual instruments for veterans' adaptation after employment. In other words, the state currently acts as the principal initiator by fulfilling an important social function with respect to veterans while simultaneously encouraging businesses to participate in this process. This situation is likely to be temporary and can be explained by two major factors. First, the labour market has become increasingly constrained, with the reserves for attracting previously inactive population groups, such as students and retirees, having been largely exhausted. Second, the anticipated gradual demobilisation will intensify competition among employers seeking access to the most valuable human capital resources. Consequently, industrial enterprises should move beyond isolated personnel decisions towards a systematic transformation of personnel management aimed at the long-term utilisation of veterans' human capital. For this reason, existing approaches should be supplemented with several recommendations that have thus far received only limited attention in Ukrainian practice.

The first recommendation is the establishment of a corporate reserve of vacancies designated for veterans. At most enterprises, recruitment activities commence only after a staffing need has arisen. However, given the expected large-scale demobilisation, enterprises should identify in advance those positions that best correspond to the competencies acquired through military service. Establishing such a reserve would reduce the time required for employment, improve workforce planning, and promote a more efficient utilisation of human capital.

The second recommendation is the introduction of competency audits for military experience. Traditional recruitment practices continue to rely primarily on the evaluation of civilian work experience, whereas military experience often receives insufficient consideration. Enterprises should therefore develop internal methodologies for assessing military-acquired competencies and systematically compare them with competency profiles required for individual positions. Such an approach would enable a more objective assessment of veterans' potential and facilitate their employment not only in occupations corresponding to their previous civilian profession but also in positions where leadership, organisational, or analytical competencies are of greater strategic value.

The third recommendation is the establishment of a strategic managerial talent pool consisting of veterans. Practical experience demonstrates that many service members acquire substantial expertise in leading personnel, coordinating complex operations, planning resources, and making decisions under crisis conditions. Accordingly, veterans should be regarded as a promising source of candidates for middle- and senior-level management positions following appropriate leadership development programmes.

The fourth recommendation involves integrating veterans into enterprise risk management processes. Military service develops high levels of situational awareness, hazard assessment skills, and the ability to anticipate alternative scenarios. These competencies create favourable conditions for veterans' active participation in occupational health and safety committees, industrial safety management, emergency response planning, civil protection, business continuity management, and enterprise-wide risk management systems.

The fifth recommendation concerns the development of internal knowledge transfer mechanisms. Veterans should be engaged as internal trainers in areas such as crisis management, leadership, teamwork, operations under extreme conditions, risk management, and safety culture. Such an approach would facilitate the transformation of individual military experience into valuable organisational knowledge.

The sixth recommendation is the integration of veteran-related issues into strategic workforce planning. Forecasting future personnel requirements should take into account expected demobilisation volumes, the occupational structure of potential candidates, opportunities for retraining, and the enterprise's long-term workforce needs. This would strengthen the alignment between personnel policy, labour market forecasts, and the post-war recovery of Ukrainian industry.

The seventh recommendation is the creation of a digital competency profile for each veteran. HR information systems should incorporate a dedicated module recording not only an employee's civilian qualifications but also competencies acquired during military service, including experience with advanced digital technologies, unmanned systems, communication technologies, logistics management, and personnel management. Such information would improve internal workforce mobility and facilitate the formation of effective project teams.

The eighth recommendation is the development of a comprehensive system for evaluating the effectiveness of veteran integration. HR analytics should be supplemented with indicators reflecting the duration of professional adaptation, veteran retention rates, the time required to achieve standard productivity levels, career progression, participation in professional development, employee engagement, and job satisfaction. Continuous monitoring of these indicators would enable timely adjustments to personnel policy.

The ninth recommendation is the integration of veteran policy into the enterprise's organisational resilience framework. Veteran employment should not be regarded merely as an isolated social initiative but rather as an integral component of organisational resilience. Under such an approach, personnel policy becomes closely interconnected with enterprise security, risk management, crisis management, knowledge management, and long-term strategic development.

The tenth recommendation is the establishment of corporate programmes supporting innovative entrepreneurship among veterans. Many veterans possess strong organisational capabilities and demonstrate a high propensity for making unconventional

decisions. Enterprises should therefore develop internal mechanisms encouraging veterans' participation in production innovation, technological process improvement projects, corporate entrepreneurship initiatives, and cross-functional project teams.

The proposed recommendations substantially broaden the traditional understanding of veterans' professional integration (Fig. 7).

Unlike existing approaches, which are primarily focused on social adaptation, these recommendations emphasise the strategic utilisation of military experience as a source of enterprise human capital development. Such a model enables veteran policy to be incorporated into the overall system of strategic personnel management, enhances the organisational resilience of industrial enterprises, and creates additional competitive advantages under the conditions of Ukraine's post-war economic modernisation.

CONCLUSION

The findings of this study demonstrate that the contemporary development of human resource management systems in industrial enterprises is characterized by their progressive transformation under the combined influence of interrelated short-term and long-term challenges.

The study confirms that the concepts of personnel, human resource management, and the human resource management system have undergone substantial conceptual evolution. Personnel in modern industrial enterprises should no longer be viewed merely as a workforce but rather as a strategic component of human capital. Consequently, the human resource management system has evolved into an integrated set of interconnected managerial processes aimed at ensuring the effective utilization of employees' competencies, supporting their professional development, enhancing motivation and organizational adaptation, and facilitating the achievement of the enterprise's strategic objectives.

The research further demonstrates that successive industrial revolutions have fundamentally shaped the evolution of human resource management approaches. Whereas the earlier industrial revolutions contributed primarily to the emergence of administrative personnel management models, digital transformation and the Industry 4.0 paradigm have established human capital as a strategic driver of enterprise innovation and long-term competitiveness. Contemporary human resource management is becoming increasingly digitalized, thereby enabling more personalized human resource decisions and supporting continuous professional learning.

The study also establishes that contemporary employee motivation systems increasingly integrate both classical and modern motivational theories and concepts. Furthermore, the full-scale war has fundamentally transformed employee motivation systems within Ukrainian industrial enterprises. The principal directions of this transformation include a stronger emphasis on employees' physical and psychological safety, the growing importance of corporate social responsibility and social support policies, and the expansion of non-financial motivational instruments. These changes have enabled motivation systems not only to stimulate improvements in labour productivity but also to enhance workforce stability and strengthen the internal organizational environment.

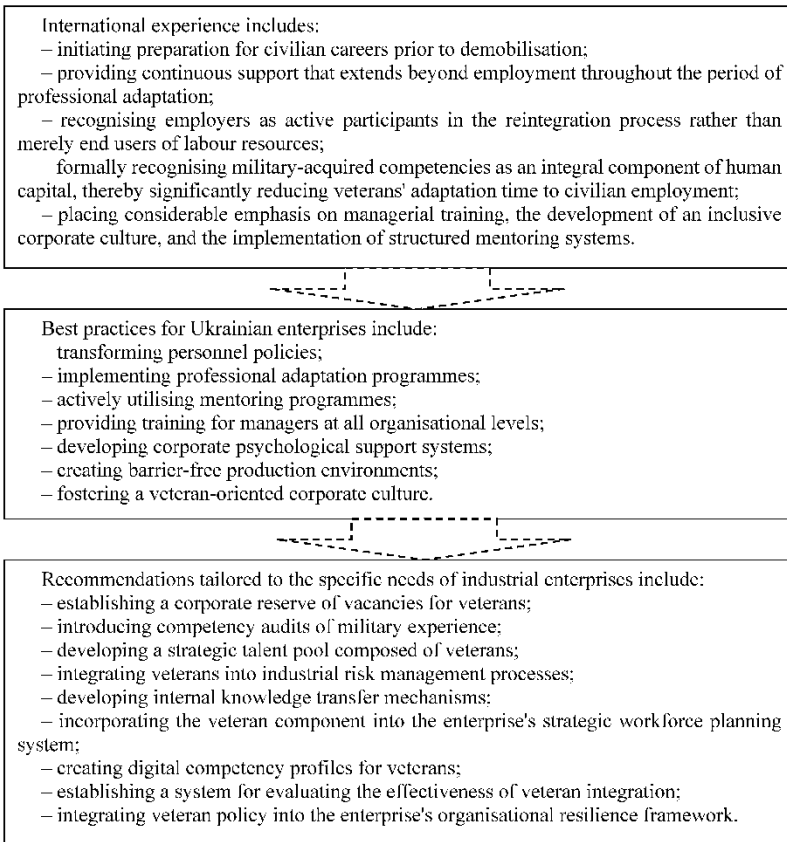


Fig. 7. International Experience and Recommendations for the Integration of Veterans into the Operations of Industrial Enterprises, *developed by the authors*

The findings further confirm that Industry 4.0 is driving a fundamental modernization of employee motivation systems. Industrial enterprises are progressively moving beyond predominantly financial incentives toward the integrated application of diverse motivational instruments supported by a high level of digitalization across all dimensions of employee interaction. Within this context, the development of human capital, the continuous enhancement of digital competencies, and the strengthening of organizational commitment emerge as the principal strategic priorities.

Overall, the research confirms that contemporary human resource management systems must exhibit a high degree of adaptability, digital maturity, innovativeness, and strategic orientation to ensure the sustainable development and long-term

competitiveness of industrial enterprises operating in an increasingly dynamic and uncertain environment.

It has been substantiated that the Russian–Ukrainian war has fundamentally transformed the perception of veterans as participants in the labour market, making their integration into industrial enterprises a strategic priority. Despite the challenges associated with professional and psychological adaptation, military service fosters the development of competencies that enhance organisational resilience, managerial effectiveness, and the competitiveness of enterprises.

It has been demonstrated that the current stage of Ukraine's veteran integration practice is characterised by a transition from a socially oriented model to a strategic human capital management model. Within this framework, veterans are regarded not as recipients of social support but as carriers of unique competencies capable of strengthening organisational resilience, enhancing innovation capacity, and improving the competitiveness of industrial enterprises in the context of post-war economic recovery.

It has been established that, according to international experience, the successful integration of veterans is based on the combination of government support and the active involvement of employers. Ukrainian practice is gradually evolving in this direction through the implementation of a competency-based approach, professional adaptation programmes, and inclusive personnel management practices. It has been demonstrated that, for industrial enterprises, the strategic priority lies in the systematic utilisation of veterans' military experience as a source of human capital development and a means of enhancing organisational resilience.

SUMMARY

During the first decade of the twenty-first century, digital technologies were primarily perceived as a hallmark of technological leadership, enabling rapid economic growth and strengthening competitive positions. Today, however, the widespread adoption of artificial intelligence and other advanced digital technologies has become not merely a source of competitive advantage but a prerequisite for organizational survival. At the same time, the principal driver of competitiveness has shifted toward the human factor, where employees interacting with cyber-physical systems act as creators of knowledge and innovation, generating ideas that underpin sustainable competitive performance. Consequently, traditional approaches to human resource management require substantial reconsideration, not only in response to the ongoing process of digitalization but also in light of a broader range of transformational factors.

For Ukrainian industrial enterprises, the most influential factor since February 2022 has been the full-scale war, which has fundamentally altered the operating environment and significantly affected workforce management practices. Identifying the nature and implications of both short- and long-term challenges provides a conceptual foundation for the evolutionary transformation of human resource management. Such transformation should simultaneously address the specific realities faced by Ukrainian enterprises and align with the global trends observed in countries leading the implementation of the Industry 4.0 paradigm. The Ukrainian labour market has undergone profound transformations as a result of successive waves of refugees, the large-scale internal displacement of the population, and the implementation of nationwide military

mobilisation. The anticipated end of the war necessitates the transformation of personnel management systems, particularly with regard to the integration of veterans into the operations of industrial enterprises. This requires a comprehensive understanding of both the opportunities and the risks associated with employing veterans, followed by the adaptation of HR management practices to secure a competitive advantage in attracting and effectively utilising this strategically important human capital resource.

Keywords: personnel management; personnel; workforce; employees; veterans; demobilization; motivation; challenge; wages; Industry 4.0; digitalization.

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Information about the authors:

Shtangret Andriy Mykhailovych,

Doctor of Economics, Professor,
Professor at the Department of Management and Marketing
in Publishing and Printing
Lviv Polytechnic National University
12, Stepana Bandery str., Lviv, 79013, Ukraine

Stetsiv Lesia Petrivna,

PhD in Economics, Associate Professor, Director
Institute of Printing and Media Technologies
Lviv Polytechnic National University
19, Pid Holoskom str., Lviv, 79020, Ukraine