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Decoding the Framework for Managing Human Resources in the Digital Era: A Conceptual Analysis

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Abstract:

In academic discourse, digital human resource management and related terms like digitalization, disruption, and transformation of HRM are becoming more and more prominent. However, these concepts are often used implicitly, with heterogeneity and proliferation. Consequently, there is a lack of conceptual clarity in research regarding these concepts. By offering a conceptual explanation of digital human resource management and associated ideas, this article seeks to close this conceptual gap. Based on extant research on digital companies, the paper creates a nomenclature and classification system for digital HRM. Establishing a core understanding, the terminology provides clear and succinct descriptions of the concepts and their links. The typology offers perfect examples that categorize and arrange phenomena related to digital HRM in an organized manner, improving the body of knowledge in this field. This article clarifies the notion of digital human resource management and its related topics by utilizing the vocabulary and typology. It presents a conceptual foundation for further research in this area and portrays digital human resource management as an evolutionary development of earlier conceptualizations of technology-based human resource management.

Keywords: Digital transformation, e-HRM, digital human resource strategy, Digitalization of human resource framework, Future of Digitalization in HRM

I. Introduction:

The digital age has revolutionized various aspects of organizational practices, including human resource management. As organizations increasingly adopt digital technologies, it becomes imperative to understand and navigate the complexities of managing human resources in this digital era. However, the existing literature lacks a clear and unified conceptual framework to address the challenges and opportunities associated with digital human resource management. The current state of conceptual clarity surrounding digital human resource management and related concepts. It highlights the implicit, heterogeneous, and proliferating usage of terms such as digitization of HRM, digital transformation of HRM, and the digital disruption of HRM. By exploring the existing literature and scholarly discussions, this section emphasizes the need for a comprehensive analysis and conceptual clarification. Building upon the broader literature on digital organizations, this section proposes a precise terminology for digital human resource management. It establishes clear definitions for key concepts and elucidates their interrelationships. By establishing a shared language, this terminology enhances conceptual clarity and facilitates meaningful discourse in the field of digital human resource management. To further untangle the conceptual framework, this section presents a typology of digital human resource management. The typology categorizes and classifies various phenomena associated with managing human resources in the digital age, providing a systematic and comprehensive view of the field. Through the identification of ideal types, this section contributes to a better understanding of the diverse approaches and practices within digital human resource management. This section explores the evolutionary nature of digital human resource management, highlighting its progression from previous technology-based HRM approaches. By analyzing the historical context and key developments, it establishes digital human resource management as an advanced and transformative paradigm in managing human resources in the digital age.

II. Literary Research

The twenty-first century is characterized by cutting-edge technologies and digitization. Changes in human behavior, skills, and competences inside businesses are under external pressure due to the revolution of HRM using digital tools. As a result of changes in human labor brought about by technological advancement, industrial processes can be made more efficient, which could endanger worker wellbeing and put current skills and knowledge to the test. Due to the unfavorable evolution of the human capital market, clause addressed the requirement for the introduction of talent management. To be competitive in the setting of the fourth industrial revolution, the author determined the necessity of introducing talent management by applying scientific information from other scientific fields closely related to HR.

The association between employee age diversity and the level of technical innovation in a corporation was examined by Mothe and Nguyen-Thi. Whysall, Owtram, and Brittain draw the conclusion that the rapid speed of technological change creates a gap between employee skills and rapidly changing requirements for their responsibilities. They base this conclusion on in-depth interviews with senior managers. Dahlbom, Siikanen, Sajasalo, and Jervenpä, who explain the need for connecting data analysts and HR specialists-who typically lack analytical skills using qualitative interviews, reaffirm this. According to A.Sharma & T.Sharma who used an analysis of the professional literature that is currently available in the field of HR and HRA, the application of HRA (Human resources analysis) shall also have a positive impact on decreasing the subjectivity of evaluating employees, which may result in an increased willingness to optimize work performance. Zhou, Liu, Chang, and Wang describe the relationship between economic advancement and the digitization of HRM (Human resources management) and the improving performance of the company using a questionnaire survey that was implemented on a sample of 211 (mostly manufacturing) companies operating in China, the world's largest labor market. An advanced digital HRM system and a company's success are found to be positively correlated, according to the examination of the data. In respect to the level of talent management development within the company, Agarwal and Maurya investigate the relationship between corporate brand strength and quality. They confirm the existence of a high association between the level of talent management development and a favorable public opinion of the company using a questionnaire survey and subsequent regression and correlation analysis. According to Jones, Hutcheson, and Camba, the present Covid-19 epidemic can benefit the advancement and digitization of systems across all industries, including human resources. Because of work from home, businesses were frequently compelled to begin investing in the digitization of their processes.

According to the aforementioned findings, HRA, talent management, and skills management must be integrated into enterprises' regular operations in the context of the Fourth Industrial Revolution. However, the integration has only been covered in a small number of papers. By using a structured training system, Nunes, Pinto, and Sousa suggest a development framework for workers' technical skills. The mapping of the OEE (Overall Equipment Effectiveness) indicator is the next step in confirming the training system's efficacy. By continuously enhancing the quality of the manufacturing process, Nunes, Pinto, and Sousa provide a way for enhancing employees' production competencies and skills. By using the QC Story method (The process of control and improving the quality in production), subsequent analysis of key indicators, and questionnaire survey, they come to the conclusion that placing more emphasis on the process of quality improvement ultimately improves qualification, or the skills and knowledge of employees. Anh and Lee suggest using the knowledge and abilities of present workers as a model profile of a qualified job applicant.

An ideal model profile of a potential job seeker is produced by skill mapping and analysis of exceptional employees. Analytical AI tools are employed in the model creation and compliance checking processes. It makes use of specific information to find candidates whose integration into the work process will be seamless; nevertheless, the system does not support the ongoing professional development of such candidates. The concept of knowledge and skills is used by Stadnicka, Arkhipov, Battaa, and Chandima to optimize the aviation maintenance process, which is a crucial process in terms of quality and safety. They provide a thorough overview of the criteria for a worker suited for carrying out the particular crucial duty by first analyzing the processes in the repair of a transport aircraft and then allocating the necessary specific skills and knowledge from the fields of technology and safety. The so-called Hall's marriage theorem, or combinatorial methods analyzing the compatibility of the requirements with the skills of a specific worker, is used to assign the

assignment to a specific person. By using skills management as a technique, Kataoka et al. concentrate on enhancing the necessary abilities for students undergoing practical training. The model's application is carried out in three steps. All of the production process's activities' expected abilities are first defined. The selection of evaluation criteria and verification techniques comes next. The final stage is to include the model into the training program's curriculum. An example of so-called experiential learning is found in the use of the training framework. The course is cycled through again and again, with the results being analyzed, until the student obtains the necessary proficiency level.

The majority of the publications that are now available only apply the system of skill development and skill mapping to a limited range of situations. There is no description of a comprehensive system that is relevant to all processes and industries.

III. Conflicts and Problems of HR Reform in the Digital Transformation Background

There are some characteristics of the current HRM such as increasingly diverse organization structures, larger span of management in the actual operation, more frequent flow of talented people within a company and between companies, and higher requirements of the quantity demanded and promptness of personnel's basic information. Therefore, companies urgently need to establish a highly efficient HRM model in order to improve the linkage of HR information, reasonably use the scientific managing tools, standardize the HRM procedure, and to provide high-quality service to company's development strategy. So far, a majority of enterprises have realized office automation, web based service of financial fund management, long-distance service of project management and other kinds of informational reform, and have developed in the direction of group business centralization. However, because of company's complex personnel structure, enforced policy of HRM work, and the diversity of professional skills of HR practitioners, the information construction of HRM falls far behind that of other parts. Specifically speaking, the current reform of HRM digitization and standardization is now facing problems resulted from the following aspects.

- **Positioning Deviation**

For a long time, "focusing on production, yet neglecting management" occurring in companies have not been completely solved, so problems of inactive mechanism and non-standard management are now facing companies. Although the business scale is expanding, the economic benefit is still in stagnation due to these problems, which has become the internal factor that restricts enterprises' development. For now, the positioning of HRM system digitization of some companies is still limited to the electronization of current business workflow, but not positioned on the actual contents of HRM, which is to systematically collect, gather and analyze the human resource information through management under the historical background of big data, and to deeply act on strategic direction planning of human resource, optimization of organization structural construction, projects' leading team establishment, precise positioning of elites, planning and development of employees' career, and management of employees' training information, etc.

Because of the vague positioning, the current human resource information system doesn't have enough supporting data. The system only serves as the operational software of HRM department, but not interacts with the closely related financial information and production management system, which has caused that companies may tend to act behind closed doors in the limited analyzing capacity of the system. Meanwhile, manager at different levels cannot deal with the office work flow, production and management procedure, and human resource service process at the same operating platform, so senior managing leaders will abandon all kinds of decision support system including human resource information system. Although the information construction is now under constant improvement, still there exists offline work flow among the senior leaders, which increases the workload and cost while decreases working efficiency.

- **Poor Integration**

In the traditional management model and information system, there are problems like decentralized internal system, poor horizontal integration, and stagnant longitudinal interconnection. Therefore, the "lonely island" and "chimney" in the current digital information system severely affects the company's uniform control efforts. The fragmented business system causes inefficient information, lack of overall data planning and failure to be

integrated into the complete management information platform. Separation from personnel planning to actual production, from annual budge to financial management, from human resource to other business systems results in that the relationship between different businesses or even the different works of same business is mostly independent, fragmented and segmentary, and difficult to realize the information sharing. Management personnel of different levels have difficulties in being informed of the complete daily human resource condition of the basic units.

Basic data are in want of efficient integration and has a lower level of standardization, in addition to which, it lacks the group and company-level data and working standard and standard business flow. Therefore, information coding is not unified with multiple definition, and it's difficult to realize the interconnection and match between data. Besides, the low degree of the availability and integration results in the poorer portability of some outstanding subsystems, which causes the failure to realize the integration and promotion of business or to efficiently support company's business analysis.

- **Lower-level Standardization of Data and Business Process**

The traditional HRM model focuses more on the management and control of specific business and doesn't have thorough understanding of the characteristics of actual production process, the increment of company brought by human resource, and the management of the labor cost caused by human resource itself. Therefore, the traditional HRM model has weaker management and control ability and cannot reasonably allocate the scarcity cost to the control center of company's total cost. Data in the management process are relatively static. The traditional model has less analysis functions, inefficient decision support and corresponding management and control ability, so the decision process relies more on the already-learned experience, and the company's management level depends more on the quality of managing personnel with higher uncertainty.

Data in the system have a lower level of standardization, in addition to which, it lacks the group and company-level data and working standard and standard business flow. Therefore, information coding is not unified with multiple definitions, and it's difficult to realize the interconnection and match between data. Besides, the low degree of the availability and integration results in the poorer portability of some outstanding subsystems, which causes the failure to realize the integration and promotion of business or to efficiently support company's business analysis.

IV. Significance of the Standardization Reform of HR in the Digital Transformation

The appearance of digitization is very important to the business transformation at present. In the past, it was a habit for HR to use the trends over past years to predict the future adjustment, which was progressive optimization. However influenced by the digital transformation, the complete business model has changed, and the infinite imaginary space of HR makes it able to rapidly carry on innovation and exploration. In the face of future exploration, HR needs to consider the system innovation from aspects of two basic disciplines. The first one is value creation, which means measures taken in HR should create better business value; the other one is effectiveness improvement - if the new HR measures can help company to improve benefits. The HR digital management information platform is a set of centralized information system, and company's management procedure can be organically connected with information technology, which can help to realize personnel's whole life cycle management from on-boarding process approval, daily personnel and salary dispatching management to leaving the company; besides, it can also realize the whole operational process management from personnel management, salary management, talent training management, real time budget control and cost management, etc. By clarifying responsibilities, the business process can be regular and standard; by applying the flexible and powerful workflow technology, fixed business process can be adopted and internal control and warning can be realized, which helps to provide the basis for the efficient control of different management levels, to restrict the arbitrariness and to strengthen the company's internal control. At the same time, changing personnel's working mode, ideas and behavior habits may help people get rid of tedious work to do creative work, and to increase working efficiency, achieve scientific decision and improve company's whole efficiency.

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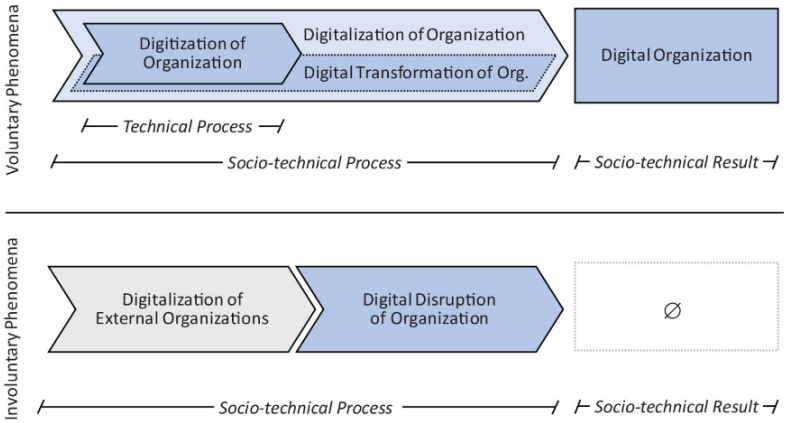


Terminology of digital organizations.

V. Necessity for the State to Deepen the Reform of Enterprises

With the state's rapid pace to deepen the enterprise reform and in the modern information society, the traditional management model is unable to satisfy the development steps of the world, and information has become the sixth energy, besides, using computers to collect information has become magic weapon of an increasing number of companies at home and abroad to improve the labor productivity, increase efficiency and get hold of the market initiatives. By applying the modules of controlling project management, office automation and HRM, and information resource sharing, the HR digital management information platform can help to simplify the work contents, refine the granularity of the basic business data information, improve the readability and comparability of human HR information, and to enhance the control efforts of HR. The effective monitoring and analysis of the flow status of HR inside and outside companies in the HR digital information system can realize the rigidity control of medium and long term budget of HR and the early-warning of the contract violation crisis. Thus it can also influence the understanding of different levels managers towards the operating conditions of companies so as to thoroughly alter the traditional way of managing, efficiently improve companies' capacity and effectiveness of management and control, and to deepen the enterprise reform.

VI. Improving Companies' Crisis Control, and Reducing Operating Costs

The HR digital management information platform improves the consistency of data and realizes the simultaneity of logistics, capital flow and information flow through the integration of all kinds of internal and external business. By integrating the overall production process, the system collects personnel, fund, materials and other important resources to realize the cooperative production work and on-demand manufacturing, improve efficiency and resource integration, avoid wasting and to minimize companies' operational crisis. The real time data analysis is also able to help to integrate, modernize, standardize and automate company's operational procedures in aspects of HRM, salary management, reports and statistics, and talents development and management. Besides, owing to the real time data analysis, the constant increase in the quantity of data and information can timely and effectively provide information, based on which companies are able to make the best decision and to resist the periodic crisis.

VII. Suggestions about the HR Standardization Reform in the Digital Transformation

In the digitization and standardization reform, the adjustment and change of the human resource will become very rapid. In order to effectively improve enterprises' overall competitive forces and sustainable development levels, the strategy needed is to construct the management model and design system blueprint to standardize the relevant business process based on the actual business situation and reviews of procedures. At the same time, on the basis of ensuring the modularization, standardization and functionization of the system construction, reduce personnel's workload, enhance the functions of data batch penetration, extraction, integration and processing, simplify the business operational process of HRM, and timely develop multi-operating platform, ensure the

information is reliable and researchable based on the integrated system, solve all the problems in the reform process by taking all the effective measures and improve the final results.

- **Properly Determining the Organizational Leadership and Personnel Allocation**

The final success of the HRM digitization and standardization reform needs the management personnel at different levels to pay high attention, clarify the staff that are responsible for the project and unify the coordination and promotion. Three parties - HR departments, Information departments and technology programmers need to work together and cooperate closely, and all the branches and subsidiaries also need to participate entirely into the project construction in accordance with the headquarters' unified progress, in addition to which, persons in charge of HR departments at different levels must ensure the efficient cooperation and organization in the whole process, and provide guarantee from aspects of resource and organization. Besides, we need to pay much attention to the effective operation after the system come into effect in the future, strengthen the building of the ranks of HR information technology, draw up a reasonable talent introduction plan, cultivate the inter-disciplinary talents who are great at both business and information technology, and form a high-quality and high-level HR informatization professional force. The training work of the whole team and various kinds of users should also be ensured in every level of the project promotion to guarantee enough training time and achieve good training results.

- **Properly Solving the Problem of Functional Positioning of System Modularization**

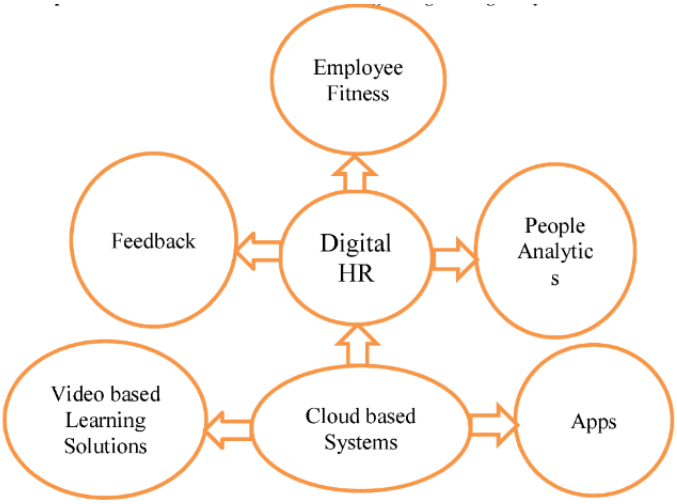
Whether the HRM information system can be successfully applied depends much on the reasonable functional positioning. The HR digitization and standardization reform must be based on the actual business situation, grasp the principal contradiction, and focus on the key part of management and control. Besides, adhere to the principles of overall planning and step-by-step implementation, divide the application system according to the quality of the relationship between the connected functional modules and the business relevance, integrate the related and similar systems, decrease the overall complexity of the system, realize the function of one of and more than one of the basic functional modules such as organization management, personnel management and salary management, and then improve and expand the optimization step by step. The companies' HRM digitization and standardization reform needs to be handled by the headquarters, and maintain the unified planning of both system planning and promotion. The system can be used to meet the demands of the management and control and analysis of headquarters and subsidiaries, establish the modularization business process through clarifying the management interfaces, responsibilities and work standard, improve the service level and professional quality of all the personnel from different levels, change personnel's existed working patterns, and transfer the focal point from business-oriented type to strategic decision making one. At the same time, select suitable business process in the system according to the actual situation, facilitate the basic unit to deeply be involved with the help of the reasonable and standard operation, improve the working efficiency and ensure the quality of data and information.

VIII. Future of Digitalization in HRM

The future of digitalization in Human Resource Management (HRM) is poised to be transformative, redefining the way organizations attract, manage, and retain talent. As technology continues to evolve at an unprecedented pace, the following trends and developments are likely to shape the digital future of HRM:

- **Increased Use of Artificial Intelligence (AI) and Machine Learning (ML):** AI and ML will play an integral role in predictive analytics, enabling HR to forecast workforce trends, enhance talent acquisition, and identify potential employee issues before they arise. These technologies will streamline decision-making processes and personalize employee experiences through intelligent automation.
- **Integration of Blockchain Technology:** Blockchain is expected to revolutionize HR processes such as background checks, credential verification, and payroll management. It offers secure, transparent, and tamper-proof data management, reducing administrative burdens and enhancing trust between employers and employees.

- **Expansion of Virtual and Augmented Reality (VR/AR):** VR and AR technologies will enhance training and development programs, enabling immersive learning experiences for employees. These tools will also support virtual onboarding processes, especially in remote work settings, providing seamless integration of new hires into organizational culture.
- **Enhanced Focus on Employee Experience:** Digital tools will prioritize employee-centric solutions, offering personalized platforms for career development, feedback, and mental health support. Employee experience platforms powered by AI will adapt to individual preferences, fostering engagement and satisfaction.
- **Rise of People Analytics:** The use of big data and advanced analytics will become more prevalent, offering insights into workforce performance, diversity and inclusion metrics, and employee engagement. This data-driven approach will empower HR professionals to make informed, strategic decisions.
- **Evolution of Remote and Hybrid Work Models:** Digital HR tools will continue to support the evolving work landscape by providing robust collaboration platforms, virtual performance management systems, and tools to enhance remote team engagement. This will enable organizations to thrive in hybrid or fully remote setups.
- **Shift Toward Agile and Adaptive HR Practices:** As digital transformation accelerates, HR teams will adopt more agile practices, focusing on continuous improvement, rapid adaptability, and iterative processes. Agile HR will support innovation and align HR practices with dynamic business needs.
- **Ethical and Responsible Use of Technology:** The future will require HR leaders to address ethical concerns associated with digital tools, such as data privacy, bias in AI algorithms, and surveillance concerns. Establishing transparent policies and fostering trust will be key to sustainable digitalization.
- **Increased Adoption of Cloud-Based Solutions:** Cloud-based HR platforms will dominate the landscape, offering scalability, accessibility, and integration with other organizational systems. These solutions will enable real-time data sharing and seamless collaboration across geographies.
- **Focus on Sustainability and Green HRM:** Digitalization will align with sustainability goals by reducing paper-based processes, optimizing resource usage, and supporting virtual operations. Green HRM will become a priority, contributing to an organization's overall sustainability efforts.



Conceptual framework for HR digital systems

IX. Conclusion

The rapid digital transformation has profoundly reshaped the landscape of human resource management (HRM), offering both opportunities and challenges. This study highlights the evolving framework of HRM in the digital age, emphasizing the need for organizations to integrate technology with traditional HR practices effectively. Digital tools such as Human Resource Information Systems, artificial intelligence, and data analytics are no

longer optional but essential for enhancing efficiency, decision-making, and employee engagement. However, digitalization also necessitates a paradigm shift in HR roles, requiring HR professionals to develop digital competencies while maintaining a human-centric approach. Balancing technological advancements with employee well-being and ethical considerations is critical to navigating this transition successfully. The conceptual framework proposed in this study provides a roadmap for organizations to adapt to the digital era while addressing key challenges such as data privacy, resistance to change, and skill gaps. By fostering a culture of continuous learning and innovation, organizations can not only optimize HR processes but also build a resilient and agile workforce ready to thrive in the digital age. In conclusion, managing human resources in the digital era requires a strategic blend of technology, adaptability, and human connection. Organizations that embrace this transformation holistically will be better positioned to achieve sustainable success in an increasingly dynamic and competitive environment. In the process of HRM digitization and standardization transformation, in order to comprehensively upgrade the HRM quality, successfully realize the final purpose of HRM digitization and standardization, we need to follow the overall strategy of unified planning, top-level design, step-by-step implementation and constant improvement, emphasize the value, and refine the procedure of relevant business and eliminate the individual Information Island through business integration. Besides, we should also standardize the "weighting system" of management, realize the high-level resource sharing, and gradually enlarge the application range to bring the final purpose into reality.

References:

1. Chih-Hsun Chuang, Shyh-jer Chen, Ching-wen Chuang, 2013, Human resource management practices and organizational social capital: the role of industrial characteristics. Journal of Business Research, 66:678-687
2. Carlos Martin-Rios, 2012, Why do firms seek to share human resource management knowledge? The importance of inter-firm networks, Journal of Business Research, 11:1-10
3. Fred Mayhew, 2012, Human service delivery in a multi-tier system: the subtleties of collaboration among partners. JHHSA SUMMER, 109-135
4. Indira, J., 2020, Digitalisation of human resource management: A changing role in digital transformation. UGC Care Listed Journal, 156-157.
5. J. D. Camba, S. Hutcheson, M. D. Jones, S. Hutcheson. Past, 2021, Present, and future barriers to digital transformation in manufacturing: A review. Journal of Manufacturing Systems, 60(9)
6. M. Agarwal, K. K. Maurya, 2018, Organisational talent management and perceived employer branding. International Journal of Organizational Analysis. 26(2)
7. Mothe, T. U. Nguyen-Thi, 2021, Does age diversity boost technological innovation? Exploring the moderating role of HR practices. European Management Journal.
8. P. Dahlbom, M. Jarvenpää, P. Sajasalo, N. Siikanen, 2019, Big data and HR analytics in the digital era. Baltic Journal of Management. 15(1)
9. Platanou, K., Mäkelä, K., Beletskiy, A., & Colicev, A., 2018, Using online data and network-based text analysis in HRM research. Journal of Organizational Effectiveness: People and Performance, 5(1), 81–97.
10. Reiman, J. R. L. Kaivo-Oja, E.-P. Takala, T. Lauraeus, E. Parviainen, 2021, Human factors and ergonomics in manufacturing in the industry 4.0 context – A scoping review. Technology in Society. 65
11. R. Sousa, S. Souza, E. Nunes, 2020, Developing organisational learning through QC story. Total Quality Management & Business Excellence. 31(13-14), 1565-1587
12. Stadnicka, D. I. Arkhipov, O. Battaïa, R. M. Chandima, 2017, Skills management in the optimization of aircraft maintenance processes. IFAC World Congres 2017. 50(1), 6912-6917
13. Sengupta, S. Lalwani, S. Goswami, P. Srivastava, 2020, Reinventing HR functions with SMAC technologies - an exploratory study. Materials Today: Proceedings. 46(1)
14. Sharma, T. Sharma. HR analytics and performance appraisal system: A conceptual framework for employee performance improvement. Management Research Review. 40(6), 684-697

15. Y. Zhou, X. Chang, G. Liu, L. Wang, 2021, The impact of HRM digitalization on firm performance: investigating three-way interactions. Asia Pacific Journal of Human Resources. 59(1), 20–43
16. Z. Whysall, M.Owtram, S. Brittain, 2019, The new talent management challenges of Industry 4.0. Journal of Management Development. 38(3)
17. Zhou Xue, 2014, Study on the Effective Approach of HRM Model of Group Company -- Based on the Case of Sinochem Group. Human Resource Development of China, 07:71-77.