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Exploring Human Resource Management Digital Transformation in the Digital Age

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Abstract
The purpose of this study is to explore how human resource management can be digitally transformed in the context of the digital economy. The drivers, directions, and impacts of human resource management digital transformation constitute the major study content. The study proposes that five factors—internal customer digital needs, industry digital innovation, competitor challenges, digital innovation governance, and digital era needs—drive human resource management digital transformation. It analyzes the essence of the human resource management digital transformation, such as digital workplace, digital human resource management processes, and digital employee services. Particularly, the study points out that digital human resource management processes refer to the implementation of selection, training and development, and assessment functions leveraging state-of-the-art digital technologies. It is emphasized that although digital transformation brings benefits for business development, its potential impacts cannot be ignored, including how the old and new human resource management systems are converted and the negative effects of the new system.

Keywords Human resource management · Digital transformation · Drivers · Transformation directions · Implications

Introduction

The current period is known as the "digital age," and digital transformation has become a global consensus among enterprises. 5G, cloud computing, big data, artificial intelligence, IoT, blockchain, and other technologies have become the driving and enabling forces of work (Yu & JInajun, 2020). Enterprises need to

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change their business models to harness the exponential changes brought about by the full arrival of the digital era so that they can act faster and adapt more quickly to the rapidly changing environment.

Digital transformation has forced us to change the way organizations operate, to the extent that becoming a fundamental part of corporate strategy (Heavin & Power, 2018). The impact of digital transformation can be found to lead to changes in consumer behavior, evaluation of services and products, and expectations (Mosca, 2020). To cope with the change in market behavior, many enterprises realize the need to transform business models to gain a sustainable competitive advantage and maintain pace with the digital evolution of their industries.

Before and after the COVID-19 outbreak, there were changes in business claims or leader claims regarding digital transformation. Before the outbreak, it may have been more of a rush or a desire to grow quickly. But the outbreak made it clear that this digitalization or online and offline integration has become a necessary point for survival. If enterprises fail to do this, they may not survive (Yu & JInajun, 2020).

Digital transformation has not only had a profound impact on all aspects of our lives, but it has also had a significant impact on human resource management (HRM) processes and roles (Schmid & Pscherer, 2021). As new digital technologies continue to evolve, the way in which HR interacts with information and data has also shifted. Some HRM processes (Mosca, 2020), like employee recruitment, performance evaluation, and human resource development, have been deeply revised through using digital technologies, which improve service delivery to stakeholders.

Digital HRM saves time and increases the productivity of HRM functions (Mosca, 2020). As highlighted by Démeijer (2017), HRM processes have become easier and faster due to digital transformation. This enables HRM specialists to concentrate better on meaningful initiatives for their functional areas. Digital HRM approaches are playing a growing role and now hold the key to shaping HR strategy and the organization as a whole.

Some scholars, such as Parry and Strohmeier (2014), focus on the influence of changes arising from HRM digital transformation, highlighting some of the challenges facing HRM in the future. In the context of current digital technology developments, it is necessary to explain the concept, drivers, transformation directions, and the implications of digital HRM.

However, our research found that numerous literature discusses digital innovation in business, industry, sales, and overall organizational management, and rarely address digital HRM changes. On the one hand, it may be that HRM is only a partial function in organizational management, which is difficult to attract leaders' attention, and on the other hand, it rarely involves cutting-edge business interests. We found after literature analysis that 22 studies about HRM digital transformation were really published, so there are many studies about HRM digital transformation that is worth exploring.

In this study, we have the following questions worth analyzing: What is digital transformation? What factors drive HRM digital transformation? What is the direction of HRM digital transformation? What are the transformation implications?

Several Concepts Related to "Digital" Are Distinguished

Digitalization, Digital Transformation, and the Digital Workforce

In this part of the study, for the sake of the subsequent discussion, we believe that several concepts need to be distinguished: digitalization, digital transformation, digital innovation, and the digital workforce.

Digitalization is different from digital transformation, which is considered as "an ability to convert an available product and service to a digital variant that provides a greater advantage than a tangible product." Murphy (2018) states that "digitization is defined as the conversion of an analog signal or information in any form into a digital format that a computer system or electronic devices into a digital format that can be comprehended." Digitization is not only just about using digital tools within an organization, but it is also a tool for implementing these innovative business models and long-term corporate strategies. Verhoef et al. (2021) argue that digitalization describes how digital technology can be made to change existing business processes. This change requires the intervention of digital technology to shape the new organizational technology structure, which would not have been possible without the timely intervention of digital technology. In the digital domain, information technology may facilitate business process relationship management and is better suited to the organization (Leviäkangas, 2016), becoming key elements of HRM operations that drive innovation. Digitalization assists in making processes within organizations more efficient and increases the sense of customer experience (Pagani & Pardo, 2017). Thus, digital technologies not only contribute to cost savings, but also improve the customer experience process for internal services.

Digital transformation has been characterized to be a key organizational shift, powered, established, or sustained by digital technologies which alter the approach to business operations (Bilgeri et al., 2017; Heilig et al., 2017). Over time, it will apply digital initiatives to achieve important reforms in the way business is managed, resulting in significant changes in an organization or an overall industry. Digital transformation changes the way the whole organization operates, especially the business processes and tasks (Amit & Zott, 2001). Furthermore, this transformation can help organizations to better interact with external customers through innovative technologies (Singh & Hess, 2020). Thus, digital technologies can support organizations in leveraging existing core competencies or developing potential core competencies to gain a competitive advantage. Due to the implementation of digital technologies, digital transformation is intrinsically linked to strategic changes in business models (Sebastian et al., 2020). In summary, digital transformation is a widespread phenomenon within organizations where organizations' business models are fundamentally transformed by innovative digital technologies. Therefore, in the pursuit of digital transformation, organizations need to balance their existing business models with new business models. As digital transformation progresses, the existing business model will encounter obsolescence (Teece, 2010). Organizations need to change their existing business from partial digital change and gradually transition to the new digital business.

Digitization, digital transformation, and digital innovation are closely related and interconnected in different ways. Firstly, these concepts are based on digital technologies. Next, the outcome of digital innovation can result in digitization through uptake in the spread phase of the digital innovation process (Fichman et al., 2014). Furthermore, we argue that digitization and digital innovation may lead to significant reforms in how business is undertaken (Osmundsen et al., 2018).

The term "digital workforce" represents a group of individuals that are influenced by new digital technologies affecting their attitudes, competencies, and actions. Professionals (e.g., HR practitioners) are required to make significant strategic and operational changes in the face of them.

Digital HRM, Transformation, and Strategy Definition

The focus of this section is on digital HRM, so based on the previous definitions around digital, it is needed to clarify the definition of digital HRM.

Digital HRM is described as "using computer systems, telecommunication networks, and interactive electronic media" to perform HRM functions (Vardarlier, 2020). Ketolainen (2018) supports the vision of digital transformation as a process. He refers to digital HRM transformation as "a process of change in which HRM transforms to digital in order to be data-driven and automated." The use of digital technology allows HRM operations to change.

Digital HRM strategy can be defined as the HRM strategy developed and implemented to create value for the organization by harnessing the digital potential (Bharadwaj et al., 2013). It may be interpreted as the convergence of HRM and technological sources and also implies the development and implementation of HRM strategies that are directly grounded on digital potential and generate corporate advantages to create value for the organization (Strohmeier, 2020).

HRM Digital Transformation Drivers

Drivers are regarded as external or internal triggers for an organization to be involved in digital transformation. The factors that drive the uptake of digital technologies are essential prerequisites for a successful digital transformation of HRM. These factors in turn impact the ultimate result of HRM digital transformation (Mosca, 2020). In the digital age, HRM exists in an increasingly unstable external environment and has to better serve its internal customers (Schmidt et al., 2017). To better exploit the benefits of digital change, HRM digital transformation is necessary (Osmundsen et al., 2018). Here, we need to analyze the HRM digital transformation drivers.

Meeting Internal Customer Expectations

Customer-centric HRM refers to HRM that aims to meet customer expectations in a specific market segment. In particular, the customer refers to all employees in the organization (Schneider, 1994). To adapt to the impact of the digital age, individuals also need to set their expectations in various ways, such as convenient digital recruitment, training through artificial intelligence for individual needs, and better

performance evaluation and feedback mechanisms based on digital platforms. To be satisfied with the needs of internal customers, HRM needs to undergo a digital transformation. The successful digital transformation can bring greater satisfaction to internal employees.

Digital HRM tends to focus on the digital needs within the internal business. This internal attention means that digital HRM transformations are considered effective when digital HRM practices raise internally determined standards of employee efficiency (Schneider, 1994). When using internal customers as a valid criterion for assessing the efficiency of digital HRM practices and processes, we need to bring employee feelings and senses into the context of the logic of client service quality.

In the same way that marketing or operations departments have come to accept that it is the critical key to business efficiency, digital HRM may fall into what has been called the "HRM trap" (Schneider, 1994). The trap is the idea that everything good (or bad) that happens to internal clients is an effect of HRM practices, procedures, and policies. As HRM digital transforms, employee-related functions such as recruiting, training, and evaluation are subject to change. Employees will have a deep sense of the changes caused by the HRM digital transformation. The ability to fully meet the needs of internal customers and reduce their loss, especially to avoid falling into HRM traps, is a factor in ensuring the success of the transformation (Huang, 2020).

Digital Transformation in Many Industries

Digital technology seems to have penetrated everywhere for a long time. Whether in the HRM field or business management in general, it seems that every aspect is being digitally innovated (Yu & JInajun, 2020). Digital technologies enable faster and easier execution of all HRM functions, from the recruitment procedure to training, from the job assessment and performance measurement to compensation, and from rewards to employment relations (Smirnova et al., 2019). Today, the field of HRM is in a state of rapid change, and it is not just about providing HR services as a support function. HRM needs to digitally transform and lead changing organizations on a global scale. As Boudreau and Strategy (2015) aptly point out, the HR industry is at a turning point, and in order to be able to add value, HR professionals need to reassess their digital capabilities and skills.

In the face of the current popularity of Industry 4.0, a prerequisite for a rapid transition to digital management is the need to explore the distinctive features of Industry 4.0 in the context of the evolutionary shaping of industrial societies (Smirnova et al., 2019). It is obvious that Industry 4.0 imposes deeper digital innovation requirements on HRM.

Digital technologies are playing a crucial part in the forthcoming 4th industrial revolution in three major ways: the growing Internet use, the spread of automated learning, and the adoption of artificial intelligence (Fregnan et al., 2020). This revolutionary technological change is changing the world of work and thus affecting managerial practices at various levels. The HRM role needs to be actively involved in addressing the spreading digital technology era, in the face of the "digital

workforce," "digital work," and "digital workforce management" (Parry & Strohmeier, 2014). Therefore, it is important to conceptualize management functions, especially digital HRM, and to acquire new competencies and tools to change and adapt activities and strategies to these novel digital workforce characteristics (Manuti & De Palma, 2018).

Traditional HRM domains (recruiting, training, performance, and compensation management) have been profoundly impacted by the digital economy. The HRM domain needs to embrace digital transformation and place good digital practices at the heart of its HRM policies (Tripathi & Kushwaha, 2017).

Changing Competitive Landscape

HRM is faced with different challenges all over the world. To succeed in the modern world, it is important for business companies to try to expand into global markets. This is the most challenging opportunity for HRM departments trying to manage the complexity of change and transformation (Tripathi & Kushwaha, 2017).

In today's rapidly changing and competitive business world, competent human resources are a strategic resource that gives companies a competitive edging (Smirnova et al., 2019). The impact of the digital revolution particularly concerns companies that aim to remain competitive in their business by being part of this new paradigm (Parry & Strohmeier, 2014). Today, both companies and individuals seem to succumb to peer pressure as competitors are starting to digitally innovate, so we must change appropriately (Yu & JInajun, 2020).

HRM professionals must respond to the increasing competition brought about by the global digital transformation and the rapid evolution of HRM technology. Future HRM practitioners will need digital knowledge, skills, and competencies. They need to be flexible to address the changes caused by the digital workplace and digital change (Tripathi & Kushwaha, 2017).

Governmental Digital Innovation Governance

Berghaus and Back (2017) suggested that some companies are facing changes in government-led digital innovation governance, which is forcing companies to rethink the method they do business and change their organizations and even the way HRM does business.

National digital innovation governance is defined as the effective organization, coordination, and guidance of coherent actions of all related entities in the national digital innovation system (or regional innovation system) with the help of relevant institutions, rules, and mechanisms to achieve the goals of promoting scientific and technological progress and improving innovation capabilities (Yuezhou, 2020). In the face of increasing complexity and uncertainty in the digital economy, the national governance system can be adapted.

With the increasing abundance of data elements, and the continuous improvement of big data processing and analysis technologies, innovations in data-driven governance models are emerging in different areas of the economy and society

(Yuezhou, 2020). For example, Jesemann, (2020) proposes targeted strategies for supporting entrepreneurial enterprises to better accommodate the requirements of the digital economy, taking into account the impact and digital transformation challenges on the economic structure and combining several typical cases of success and failure in the Rust Belt of the USA and the Ruhr region of Germany. He argues that traditional industrial regions should be fully aware of the innovation trends of the digital age and prepare for them in advance. Tou et al. (2019) combine the successful experiences of Finland and Singapore and propose to integrate digital innovation resources into the national production system to form a new open innovation mechanism under the conditions of a digital economy.

Digital innovation programs led by governments around the world have brought about digital changes in HRM. One of the main directions of the successful implementation of innovation programs is "digital economy talent" (Smirnova et al., 2019). HRM is one of the main parameters of ensuring the competitiveness of companies in the digital age. The formation of the "digital economy talent" means, first of all, the improvement of the training system, which should supply the required competencies for the digital economy in the Industry 4.0 environment; it also includes the rapid reorganization of the traditional talent needs to ensure the availability of modern digital competencies and a system of employee incentives to acquire the necessary competencies and personnel to participate in the digital economy development. It is clear that HRM needs to adopt digital changes in line with the governmental digital innovation governance plan.

VUCA Era Needs

Economic and social development has entered the VUCA era characterized by volatility, uncertainty, complexity, and ambiguity (Media, 2021). The new round of technological revolution and industrial change is accelerating. While giving rise to various new models and modes of the digital economy, it also strengthens the VUCA characteristics of economic and social operation. As we are in the era of VUCA, we already feel that HRM is facing great challenges.

In the HRM field, volatility refers to the increased frequency of talent mobility. In the digital economy, many companies are experiencing a very high turnover of talent. By 2020, the majority of the workforce will be millennials, who have a different mindset. Unlike previous generations, millennials are looking for employers who will give them purpose, job satisfaction, and career growth (Media, 2021). The "war for talent" is becoming increasingly challenging for organizations.

Uncertainty refers to the high degree of uncertainty in acquiring talent. High uncertainty involves changes in digital talent standards, business needs, and the environment. Uncertainty includes what talent is really needed and what talent is really defined by us.

Complexity refers to the fact that the talent management environment has become particularly complex. Talent management in today's environment is influenced by politics, economics, technology, culture, and values.

Ambiguity refers to the ambiguity of recruiting digital talent. Digital transformation cannot be successful without digital technology translating into intelligent efficiency and results that permeate every person and business at work.

Therefore, in the VUCA era, the challenge of HRM work is to recruit and train digital talent, help employees with digital transformation, and help CEOs reshape their view of employment and values in the VUCA environment.

HRM Digital Transformation Directions

The digital HRM function is an organizational activity (Thite, 2020). It includes all employee-related activities such as the employee working environment, HRM processes, and employee services. The following section will explain the digital processes of the basic HRM functions.

Digital Workplace Application

Different scholars have suggested that HRM plays an important role in workplace innovation and employee well-being (e.g., suitable office space and efficient work style) (Bamber et al., 2017; Kowalski & Loretto, 2017). Digital transformation of the workplace, which helps to improve employee performance and increase organizational effectiveness, is also an important task of digital transformation of HRM.

Digital transformation in the workplace is about embedding digital technologies like ICT, especially web technologies in the work process. There are at least two relevant results for the digital management of the organization (Fabbri et al., 2019). First, it makes workplace collaboration increasingly powerful. Second, it makes work always "visible" with the progressive adoption of digital technologies in the enterprise: as work processes become increasingly digital, work behavior generates digital trace assets that provide unprecedented access to information.

Digitization has entered our workplace, bringing new applications for internal communication (Thite, 2020). While the popularity of these channels differs in different companies, the significance of internal communication will grow as the concepts of digital and social workplace become more prevalent in organizations (Vardarlier, 2020).

Organizations shall locate their internal digital communication strategies (Vardarlier, 2020). To make it easier for employees to gain access to management, organizations should establish communication channels, such as the use of social media. This process should not only be embraced by management but should also be popularized at all levels of the corporate culture. Therefore, organizations should recognize the importance of digital conversion across levels.

The digital workplace facilitates an online work environment that enhances transparency, improves synergy, boosts employee engagement, and increases team productivity. However, the expectations encouraged by digital technology have also created significant pressure for change in the workplace (Betchoo, 2016). Many companies are faced with the challenge of retaining and motivating their most talented young employees who have become accustomed to the more mixed work-life balancing that digital technology brings. Today's millennials have grown up in the world with digital technology. They use social media, search, collaboration, and

other digital technologies as an integral element of their lives and work, and their expectations are shaped by their life experiences.

Digital HRM Processes

Modern organizations need to reposition the value of HRM operations and create end-to-end, closed-loop HRM processes with the help of digital technology and digital operations thinking. Digital transformation brings about a positive influence on HRM and will produce visible changes in selection, training & development, performance, and service quality (Betchoo, 2016).

Talent Selection

Recruitment and staffing have become the main focus of digital technology adoption in HRM organizations. DiRomualdo et al. (2018) noted that the application of digital HRM practices has reduced the intensity of work in selecting candidates, analyzing the skill requirements needed to fill vacant positions, and selecting whom to be recruited.

As the Internet has become widely used, the HRM recruitment process in companies has also changed (Vardarlier, 2020). Prior to the discovery of the Internet, talent recruitment was mainly conducted through traditional methods such as job postings and newspapers. Recently, recruitment initiatives of professional networking and employment websites have evolved in the online environment.

Social media platforms allow access to qualified talents in a short period and at a low cost. Compared to traditional forms of recruitment, recruiting and selection through social networking sites are more cost-effective. With the help of digital technology, many companies utilize social media platforms such as Facebook, Glassdoor, and LinkedIn as recruiting tools, and it has been an essential mechanism for employers and job seekers in the recruitment process (Tripathi & Kushwaha, 2017). Through these social media strategies, recruiters are able to reach out to more potential candidates, thus increasing the likelihood of identifying suitable candidates.

Artificial intelligence is also being used to some extent in the recruitment field. Real big data and smart technologies are the most widely used in selection recruitment, using intelligent algorithms to identify, as well as accurate profiling. Predictive models for job suitability and adaptation to the organization are also becoming more and more refined (Yu & JInajun, 2020). We can even take online interviews, video interviews, and voice interviews, through the application of various algorithms. Adaptability prediction can be done through expression algorithms and voice algorithms.

Training and Development

The Internet advent and the quick growth of personalized training became commonplace in the 1990s, and by the 2000s, companies began to discover the momentum of digital education. Technological advances in the global workplace now have a deep

influence on the role of human resource development (HRD) specialists (Betchoo, 2016). Previously, HRD technologies were used mainly in educational settings to support training (Benson et al., 2002). The advent of current digital technologies allows for greater flexibility and integration. Digital technologies are fundamentally redefining the future of training and development functions.

The development of digital systems has highlighted the idea of e-learning. The more applied e-learning nowadays is primarily through the use of electronic media and especially the use of computers for learning (Vardarlier, 2020). And the main trend in the future of digital learning is adaptive learning using artificial intelligence (AI). The salient feature of AI learning is personalized training, which uses individual learning trajectories and introduces individual development programs to create a development environment that does not disrupt creativity and offers a high-achieving (Evseeva et al., 2019).

Corporate digital training activities are a collection of systems (Vardarlier, 2020). Through the system to be established within the company, it is possible to create a training pool where diversity is a priority. Employees will be able to decide their own training, they will be able to allocate training time at any given time, and they will be able to access training materials and training identified from their location. HRM professionals will be able to train new staff in a more effective way (Nawaz, 2017). By having remote access to company information and training programs, trainers would not need to work directly with new employees in all training programs.

Evaluative Functions

Regarding talent inventory, assessment, and motivation, they are collectively referred to as evaluative functions. Today, these evaluations are becoming more and more accurate as employee behavior is increasingly left on data platforms. It means that employees' behavior and performance are increasingly being fully data-driven and recorded (Yu & JInajun, 2020). All information has to be generated and executed on the basis of data. It is much easier to integrate the obtained operational information into the digital context (Vardarlier, 2020). Data related to employees will form a personal data account, including behavior on the job, attendance, attitude inventory, and competency evaluation. (Yu & JInajun, 2020).

Companies can develop a database where they can access data on employee performance levels, employee turnover, absenteeism, organizational financial opportunities, etc. (Vardarlier, 2020).

The concept of "big data" in which we live has significant opportunities for HRM (Vardarlier, 2020). Big data transforms information into meaningful and workable formats. When integrating digitally, there is a need to clarify what kind of information will be available for big data objectives and to determine the appropriate information gathering and analysis instruments. Capturing and tabulating information by comparing the daily growing volume of data with past information is particularly useful for achieving outcomes that will be valuable in the policymaking process of the HRM function.

Around the world, HRM professionals and company CEOs are increasingly focused on analyzing and gathering data about their workers. The application of big data and data mining in the domain of HRM and transforming human resource data into profitable operational solutions allows us to leverage facts-based information, forecast analysis, and obtain a greater return on HR investment (Evseeva et al., 2019).

Digital Employee Services

The main goal of HRM would be to make sure that employees are working for the business's success by taking HRM outside of administrative functions (Thite, 2020). In an era of digital innovation, HRM around the world is using digital apps, artificial intelligence, and bots to create "employee experience platforms" that support ongoing employee needs.

The effective use of digital across all HRM functions. In this way, they meet the needs of employees by offering speed, quality, and cost advantages (Ladkin & Buhalis, 2016) Digital service centers provide efficient, high-quality, and diverse employee services to realize the goals of cost reduction and high-efficiency, better employee experience, and increase their commitment.

Through digital technology, we provide a full lifecycle and comprehensive employee service content. It may build an intelligent digital service system covering the entire career cycle of employees from accepting an offer to leaving the company. It will not only automate HRM activities but also input and output data faster and more accurately than employees (Yu & JInajun, 2020). As the boundary between work and life is getting blurred, in pursuit of high employee experience and high engagement, advanced companies have started to provide employee services that extend from regular personnel services to the life aspects of employees (e.g., travel, housing, marriage).

Through digital technology, omnichannel and intelligent service methods access the ultimate digital experience. With full consideration of employee service scenarios, increased companies are providing Web portals, mobile apps, WeChat public numbers, self-service terminals, and call lines to make employee services available anytime and anywhere. The use of technologies such as smart robots and semantic analysis allows employees to benefit from intelligent services for the extreme digital service.

HRM Digital Transformation Implications

After analyzing the drivers and directions of HRM digital transformation, HRM faces different transformation implications. HRM digital transformation requires more than improving operation with digital technology. It needs to rethink the new digital HRM business logic, the digital transformation challenges, the impact on performance, and digital ethics (Osmundsen et al., 2018; Piccinini et al., 2015).

Parallel and Transition Between Old and New HRM Systems

Hunt (2014) states that transforming HRM requires digital innovation, but we have to consider the interface and transition between the old HRM operating rules and the emerging digital transformed HRM. There are usually three approaches: grafting, bridging, and decoupling (Tumbas et al., 2018).

Grafting involves combining the existing HRM logic with the emerging digital action logic. HRM teams with hybrid capabilities act toward a common goal. Grafting involves a longer-term vision, which can cause completely different working models when the organization coordinates different action logics.

Bridging includes creating links between current functional units to enable novel digital initiatives. It is also about bridging digital change based on the existing HRM operational processes. This facilitates the discovery of reorganizations of existing executive roles and the formation of new digital work patterns.

Decoupling explains how novel digital initiatives can be separated from current functional units to enable novel digital initiatives. In doing so, it is easy to execute digital changes quickly and to reach goals. However, it lacks interface with the existing HRM processes and can easily fall into a "siloed" state. This can prove difficult to sustain in the long term, especially when digital capabilities require infusion into legacy organizational units.

It is unrealistic to parallel the old and new HRM systems and expect the digital transformation to be a one-time success. It is a great digital change management process that requires a risk-taking approach by the organization and its employees.

Challenges of the New HRM Model

New roles are set up (DiRomualdo et al., 2018). With HRM delivery becoming increasingly digital, many current roles are expected to be more specialized and even new roles will emerge. HRM must begin to plan for the role changes to meet the needs of the digital transformation of the enterprise and utilize these chances to enhance HRM abilities, service delivery, and job performance. Much of the work done by HR will be automated. With the reduction of administrative positions, where possible, adequate training and transition support will be provided to affected employees to fulfill the newly created role of the HRM department. For example, the Workforce Data Project Leader would be accountable for all end-to-end data analytics projects and data operations consolidation and calculations.

The response of the original personnel (Sotnikova et al., 2020). As a result of digital changes in work processes, there is a risk of layoffs at the lower and middle-skill levels. However, due to the process automation of layoffs, companies can give their employees retraining and realize the most interesting activities in their own field. Possible problems in the implementation of this program are the resistance of employees, especially the older generation, to digital transformation and the lack of motivation of employees to master the digital economy competencies and participate in the digital development of the organization (Vakulenko et al., 2016).

Developing digital system capabilities (Sotnikova et al., 2020). Usage and continuous design iterations also underpin these efforts. To succeed in the new model, HRM teams may need to work with IT to adapt design thinking, use integration analysis, and carefully analyze software vendor decisions. It is a whole different world for HRM technology and project teams which would create new career chances and change the influence of HRM on the business.

Data security issues (Sotnikova et al., 2020). Any change will come with the high losses of mistakes. Sadly, no system is free from mistakes, and perhaps, the innovative technologies also could fail. A small mistake in constructing an algorithm can lead not only to the loss of financial resources but also to the loss of important information and data. In addition, when digitally transforming HRM processes, special attention should be given to digital security issues, as information presented in cyberspace is often subject to various cyberattacks and data breaches.

Impact on Performance

Digitally transformed HRM is ripe for better use of digital technologies to improve business performance. Digitally integrated HRM business processes add performance gains from information systems functions, improve transparency, and monitor cost reductions (Osmundsen et al., 2018). It can nurture digital HRM strategies that result in process refinement and modularity and can bring in novel practices and creative initiatives.

The benefits of digital HRM include improved productivity via organizational efficiency, less bureaucracy, lower costs, and the creation of additional value (Vardarlier, 2020). It reduces the routinized and tedious operational processes of HRM, enhances its productivity, and gives it permission to shift toward strategic domains that are of value to the organization. The fact that digital HRM systems are easy and quick, enabling employees to upgrade their abilities to improve their skills and enhance their performance, makes the system the preferred and broadly available for the organization and its management (Öğe, 2004).

Bondarouk and Brewster (2016) highlight the challenges of conceptualizing digital HRM and the need to adopt a longer-term view when dealing with the outcomes of digital transformation. It is argued that "good digital HRM includes actions and policies that are conducive to the long-term success and survival of a company, not just generating shorter-term returns for shareholders." The performance outcomes of HRM digital transformation need to be assessed from the perspective of long-term benefits.

Digital Ethics

As organizations progressively move forward with their digital HRM transformation, there is a need to focus on the ethical issues raised by digital technology. Lobschat et al. (2021) have developed the concept of Corporate Digital Responsibility (CDR), described as a group of accepted principles and values that direct a company's major information technology and data procedures. These processes are related to the creation of technology and access to data, operations and decision-making, inspection and impact assessment, and the refinement of technology and data. The new concept of CDR highlights its importance based on the different stakeholder perspectives. Operational guidelines on common CDR norms and values can be developed. The operational guidelines may be followed and implemented jointly by stakeholders in the digital HRM transformation process.

Future Research Directions

It is suggested that the following areas could be explored in depth with regard to future research directions on digital HRM change. Digital hiring involves the use of advanced technologies (e.g., AI chatbot, blockchain) for job posting, candidate profile screening, interviewing, and hiring. Artificial intelligence technology can save costs and use historical data to quickly and accurately screen potential candidates' profiles. Blockchain technology allows for peer-to-peer sharing of job information and ensures privacy. How these similarly advanced technologies can be applied in digital hiring and the related issues (e.g., discrimination, fairness, confidentiality of information) allows for further research in the future; digital training, including knowledge base building, development of training needs, training execution, and feedback on results through advanced technologies (e.g., artificial intelligence, metaverse). AI technology can intelligently retrieve the knowledge required by an organization or individual and build the appropriate knowledge base. In the future, researchers may consider how AI technology can gather knowledge and organize personalized training. Using 3D technology, with the help of the Metaverse construct, people can learn the required knowledge in virtual worlds in the form of avatars. It is suggested that researchers could explore how metaverse technology could be applied to digital training in the future, how training in virtual worlds could ensure the privacy of personal information, and the harm of excessive indulgence in digital worlds (e.g., learning in metaverse with game modules).

Contributions and Conclusions

This research provides the following recommendations for HRM practitioners as well as theoretical researchers. (1) The study analyzes the drivers of HRM digital transformation for organizational managers and HRM practitioners and helps them to understand the underlying reasons for HRM digital transformation. As a result, people need to reconsider the possibility or the urgency of HRM digital transformation in the context of the internal and external organizational environment. As a business partner, HRM needs to face internal customer requirements (e.g., to deliver digital HRM processes) as well as external factors such as competition, industry developments, and government regulation. In order to meet these internal and external demands, there is a need to carry out HRM digital transformation and upgrades, without which it cannot face competitive pressures and gain a business advantage. (2) In addition to the drivers for transformation, HRM needs to consider the direction of transformation, that is, what HRM business area to transform in. This helps to direct attention to the key of digital HRM transformation so as not to stray from the core digital HRM business area. The study analyzes the elements of digital HRM transformation from the HRM perspective, including shaping the digital workplace, providing internal digital

services and digital HRM business processes (e.g., selection, training, and assessment). (3) Our study also considers some of the consequences of the digital transformation of HRM. Managers need to consider and assess these consequences in advance. Possible implications include how to transition between the two HRM systems, the negative impact of the new digital HRM system, the impact of digital HRM on work outcomes, and digital ethics. The study reminds managers of the need to consider the possible implications of the new digital system. After assessing these impacts, organizations need to decide whether to adopt minor digital HRM changes to transition or a large-scale approach.

This study aims to explore how human resource management can be digitally transformed in the context of the digital economy. Firstly, several concepts related to "digital" are distinguished. Then, after searching and analyzing the literature, we propose that the drivers of HRM digital transformation include meeting internal customer expectations, the digital transformation of the industry, influence of competition, digital innovation of the government, and the needs of the VUCA era. HRM digital transformation directions involve the digital workplace, digital HRM processes, and digital employee services. Among them, the digital HRM process mainly focuses on talent selection, training and development, and evaluative functions. HRM digital transformation will bring certain implications, including how to parallel and transit between the old and new HRM systems, what are the challenges of the new digital HRM, the impact on performance, and digital ethics. In the digital era, there is not enough research in the field of HRM digital transformation, which also gives us researchers more opportunities to explore.

Declarations

Conflict of Interest The authors declare no competing interests.

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