Digital Transformation: Challenges for Human Resources Management

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Abstract

The global economic situation and need to be better prepared for competitive challenges put pressure on modern companies to shift toward automation and digitalization. As a consequence of rapid technological development and the speed of change and therefore forced transformation of business models and work design, organizations are faced with a need for a massive change of features and an extended role of HR management processes. To be able to drive future organizational performance, HR leaders and professionals are required to make changes in the skills and competencies they have and to acquire and possess new ones. The critical components of a digital transformation strategy that can help achieve a competitive advantage are human capital, intellectual capital, and knowledge. The purpose of this paper is to explore and elaborate on the contemporary position and the changing function of HRM in light of digital transformation. In that sense, a comprehensive analysis of available literature has been conducted addressing the domains of HR planning, reward management, performance management, employee engagement, training and development, health and safety, employee relations, as well as their change under the influence of digital transformation. As the main conclusion of this research, it can be stated that although digitalization, i.e., digital transformation, strongly affects HR practices and procedures specifically by using human resources information systems, the role of HR in contributing to the digitization strategy is not sufficiently emphasized. However, it can be argued that the results of this research represent a valuable contribution to future research and can certainly be an important benchmark for organizations when preparing strategies to respond to the challenges of the digital age.

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Introduction

Contemporary organizations are strongly affected by digital "(r)evolution" in many different ways and on multiple levels. The effects of digitalization directly impact all the processes in an organization internally and in relation to external stakeholders (Bajer, 2017; Horváth et al., 2019). In that sense, digitalization is a process of utmost importance for economies and societies which started a long time ago, receiving forceful acceleration by development and adoption of newest technologies such as data mining, Internet of Things, Artificial intelligence, Blockchain technology, Big Data Analytics, etc (Kagermann, 2015; Schwanholz et al., 2018; Rachinger et al., 2019).

According to previous research, digitalization has been studied mainly in the light of its influence and consequences of its adoption on customer preferences, buying behavior, marketing, and business performance, while research on how it affects an organization's internal processes and behavior especially in terms of implication to human resources management was fairly seldom (Burchardt et al., 2019; Branca et al., 2020).

Rapid development and adoption of technologies such as Cloud Computing, Edge Computing, Mobile Apps, Social, Big Data Analytics and IoT help organizations to exploit characteristics of such transformative technologies in terms of improving business agility, accelerating innovation and transforming business processes, and introducing new business models (Bajer, 2017; Schwanholz et al., 2018; Rachinger et al., 2019; Zehir et al., 2020).

The adoption of new technologies and digitalization of organizational processes have forced the rapid evolution of HRM practices, requiring the development and adoption of new HR competencies, new forms of employment, and agile HR processes (Kagermann, 2015; Horváth et al., 2019). In that respect and to enable and accommodate rapid technological change and development, organizations are expected to develop procedures and establish practices for a continuous reappraisal of employee competencies, and also to introduce new forms of work organization (Sakellaridis et al., 2011; Götz et al., 2020).

Most of today's HR practices are developed stable and long-lasting employment forms and it can be challenging for an organization to apply those practices to new forms of employment such as permanently changing conditions of contracts based on project principles (Demartini et al., 2018; Cichosz et al., 2020). Thereby, as a result of the adoption of accelerated technological changes, those increasing new flexible employment forms affect also competence and career development practices representing the changeable work environment (Rachinger et al., 2019).

Digitalization implies a complete transformation of business, revision and upgrading or development of new business models, and continuous revision of business strategy and fundamental innovation of business processes (Kagermann, 2015; Schwanholz et al., 2018; Parida et al., 2019). To achieve and maintain business performance, digitalization requires organizations to change organizational culture, and introduce a new type of leadership such as open leadership and self-leadership (Burchardt et al., 2019; Cortellazzo et al., 2019).

To better understand this technological transformation and its impact on organizational functioning, the difference and context between digitization and digitalization (Parviainen et al., 2017; Branca et al., 2020). Digitization means "*the action or process of digitizing; the conversion of analog data into digital form*" (Berman et al., 2014), while the term digitalization denotes the transformation of business functions and business models into the digital form (Legner et al., 2017;

Burchardt et al., 2019; Ritter et al., 2020). Digitalization is also used to denote the integration of digital technologies into various areas of a business.

Digital transformation

The digital transformation is the crucial facet of the current radical changes in the functioning of modern economies. The emergence and rapid development of digital technologies such as Big Data, Machine Learning (ML), Artificial Intelligence (AI), Internet-of-Things (IoT), Internet-of-Services, Mechatronics, and Advanced Robotics, Cloud Computing, Cybersecurity, Additive Manufacturing, Digital Twin, and Machine to Machine (M2M) communication enable organizations to develop new business models and new employee skills and competencies resulting in achieving efficient product optimization and improving overall organizational performance and competitiveness (Sakellaridis et al., 2011; Bajer, 2017; Demartini et al., 2018; Branca et al., 2020; Zehir et al., 2020).

The concept of digital transformation is widely used to depict various processes of digitization or digitalization of processes and practices within organizations, but there is no consensus regarding a unified definition of it (Li, 2018; Burchardt et al., 2019; Gong et al., 2021). It is defined and described as a strategy (Legner et al., 2017; Schwanholz et al., 2018; Rachinger et al., 2019), a process (Kagermann, 2015; Gong et al., 2021), or a business model (Sakellaridis et al., 2011; Parida et al., 2019; Horváth et al., 2019; Ritter et al., 2020). In general, digital transformation is described as "*the use of new digital technologies (..) to enable major business improvements*" (Fitzgerald et al., 2014).

It is important to point out that digital transformation is not defined as unique technology, but rather it is viewed as a set of significant change interventions based on a "*combination of information, computing, communication, and connectivity technologies*"(Bharadwaj et al., 2013). Another definition describes the concept of digital transformation as "*a fusion of advanced technologies*" that are integrating physical and digital systems (Li, 2018; Burchardt et al., 2019; Cichosz et al., 2020).

The key effect of digital transformation is value creation in terms of operational effectiveness, successful business model, organizational performance, and competitive advantage (Legner et al., 2017; Branca et al., 2020; Gong et al., 2021). It includes also superior customer experience, better relationships with stakeholders, significant cost reduction, and enhanced strategic differentiation (Götz et al., 2020). Digital transformation also implies new concepts and rules of business at both, internal and external levels (Nivlouei, 2014; Demartini et al., 2018; Rachinger et al., 2019).

The digital transformation is considered as a set of ongoing processes affected in great measure with organizational readiness and digital maturity (Rachinger et al., 2019), where under the term digital maturity is understood (a) digital capabilities, which indicate the intensity of digital initiatives (Nivlouei, 2014; Horváth et al., 2019; Mirković et al., 2019) and (b) transformation management capabilities in terms of leadership, culture, change management, governance (Cichosz, 2018; Parida et al., 2019; Gong et al., 2021).

As research results indicate, the implementation of digital transformation processes is a very complex and demanding activity that can be slowed down or stopped by various obstacles that can affect its success. Therefore, the identification of obstacles and understanding their nature and assessment of the probability of their occurrence is an important element of successful adoption of the concept of digital transformation (Horváth et al., 2019; Cichosz et al., 2020). Among numerous possible obstacles, various studies identified employees as the biggest challenge

and key factor of success for digital transformation emphasizing employee's competency traps, difficulties with changing employee's mindsets and beliefs and employee's IT knowledge, skills, and capabilities (Bajer, 2017; Legner et al., 2017; Cortellazzo et al., 2019).

Establishing an organizational digital transformation strategy creates a framework for an organization to leverage all the possibilities and features of available new technologies.

The implementation of digital technologies enables organizations to deploy various new processes along the whole value chain. In that respect, digital transformation can be considered as a holistic approach that encompasses all functions, areas, and processes enabling it to utilize organizational digital potentials (Nivlouei, 2014; Rachinger et al., 2019; Mirković et al., 2019). In that sense, digital transformation is not just a transfer of data and documents from analog to digital form, but business processes networking, the development of effective interfaces, and integrated data exchange and management (Legner et al., 2017; Ritter et al., 2020; Kurek, 2021).

Successfully implemented digital transformation supports organizations in:

- Ensuring continuous responsiveness in the context of changing future demand and securing the market position; (Demartini et al., 2018)
- Maintaining competitiveness by applying efficient processes with cost and resources saving;
- Achieving higher product quality (Li, 2018);
- Maximizing organizational performance (Sakellaridis et al., 2011),
- Planning a flexible production (Cichosz et al., 2020)

These can be achieved by the development of features such as real-time capability, interoperability, and the horizontal and vertical integration of production systems (Sakellaridis et al., 2011; Horváth et al., 2019). Besides, it allows organizations to deploy flexible work, through self-organization and multi-tasking skills, according to education and lifelong learning initiatives.

HRM challenges caused by digital transformation

Given the impact of digital transformation on organizational processes and therefore the ability of organizations to adopt more flexible working arrangements for renewal and further development of organizational culture will be a top priority for human resource management (Nivlouei, 2014; Demartini et al., 2018; Gong et al., 2021). Cultural transformation as a consequence of digital transformation is an uncharacteristic challenge for modern HRM practice and requires the integration of HRM strategy with organizational strategy and goals, as well as the development of procedures and standards that support employees operating in changing working conditions and customer requirements (Selmer et al., 2004; Marler et al., 2016; Branca et al., 2020).

The existing organizational culture must find answers related to the shift towards a hybrid work model that takes advantage of remote and office work (Ancarani et al., 2018; Am et al., 2020). Different working conditions such as reduced face-to-face interaction and increasing dispersion of the workforce will lead to a change in social dynamics among employees (Bajer, 2017; Götz et al., 2020).

The introduction of remote working has dramatically changed the way we work, and some employees might undergo the need for additional learning to achieve the same level of efficiency.

Furthermore, due to the effects of digital transformation, the HRM function can introduce a performance management system based on the results achieved,

where employee performance is measured exclusively based on their performance and not on time spent at work (Ulrich et al., 2013; Demartini et al., 2018; Horváth et al., 2019). In that sense, digital transformation allows organizations to introduce performance monitoring technology to track employee work performance and results achieved (Nivlouei, 2014; Li, 2018).

Adoption of new technologies enables HRM function in the organization to develop sound succession planning strategies by identifying and rethinking critical roles and establishing contingency plans using scenario-based planning instead of traditional HR planning (Selmer et al., 2004; Sakellaridis et al., 2011; Bajer, 2017). The key success element of this process is effective communication to ensure employee readiness.

In performing its strategic role, learning and development are an integral part of contemporary HRM practice. It especially refers to the improvement of the knowledge and skills of its employees with transferable and specialized skills, thus providing them with a competitive advantage and making them more resistant to change (Ulrich et al., 2013; Ancarani et al., 2018; Kurek, 2021).

An important element of organizational HR strategy is workforce analysis. The implemented digital technologies allow HRM function to measure employee experience, engagement, and satisfaction (Selmer et al., 2004; Fenech et al., 2019). The use of analytics enables organizations to better assess workforce requirements, monitor employees' performance and productivity, optimize revenue, and reduce costs of operation (Nivlouei, 2014; Marler et al., 2016; Li, 2018). It also helps to establish a strategy for talent acquisition, and redefine recruitment processes creating a cost-effective and effective operating model (Horváth et al., 2019; Sima et al., 2020).

The increasing use and growth of remote working have enabled the emergence of alternative employment strategies such as the application of a virtual environment in the process of planning, searching, evaluating, selecting, and hiring of talents (Marler et al., 2016; Rashid, 2017; Cortellazzo et al., 2019). Digital transformation of HRM function is driven by the implementation of technologies such as Artificial Intelligence (AI), Virtual Reality (VR), Augmented Reality (AR), and Blockchain complemented with data science, at the same time enabling the establishment of a decision-making system at the level of the entire organization free from bias (Ancarani et al., 2018; Sima et al., 2020; Zehir et al., 2020; Kurek, 2021).

These technologies may be used to improve all HR functions. Using data science and AI applications, organizations can reduce costs and time by using automated CV screening processes in hiring cycles (Rashid, 2017; Demartini et al., 2018; Götz et al., 2020). Big data and data analytics may be used to improve the recruitment process by helping to identify top talent and assess workforce performance and capacity requirements (Sakellaridis et al., 2011; Manuti et al., 2018; Am et al., 2020). AR and VR technology may be used to improve the orientation process through virtual office tours, without requiring new employees to be physically present. Using virtual and digital learning platforms will enable organizations to accelerate and make re-skilling and up-skilling processes more efficient without investing in the infrastructure and logistics required for hands-on training (Ancarani et al., 2018; Bajer, 2017; Zehir et al., 2020; Sankar et al., 2021).

Some studies have reported also some critical aspects of the implementation of digital technologies. Digital transformation does not only bring positive effects, having particularly negative impacts on low-skilled works and repetitive tasks (Manuti et al., 2018; Fenech et al., 2019; Gong et al., 2021). Despite all the positive perspectives of digital transformation, human experience cannot be replaced.

However, to realize all the opportunities provided by the digital transformation, the organization needs to ensure the development of knowledge, skills, and abilities of the workforce to maintain the required level of competitiveness and organizational performance (Demartini et al., 2018; Am et al., 2020). The processes of upgrading knowledge and skills will enable the creation of a workforce adaptable to the rapidly changing new conditions and requirements brought by the application of digital technologies (Ulrich et al., 2013; Marler et al., 2016; Sankar et al., 2021).

Redesigning business processes and integrating them with new digital technologies and aligning jobs and employees will certainly help improve the overall success of the organization (Ancarani et al., 2018; Kurek, 2021). Furthermore, in the context of digital transformation, the opportunity opens up for HRM to influence changes in organizational culture, contribute to improving the relationship between employees and the organization and create an environment that has a positive effect on employee engagement and well-being (Rimon, 2017; Cortellazzo et al., 2019; Sima et al., 2020).

Numerous studies have shown that changes in employee behavior, attitudes, and expectations induced by the implementation of digital transformation processes are the main challenges modern HRM functions are facing within an effort to meet the requirements of operational and strategic adjustment and prepare organizational processes for a changing profile of modern workforce (Ulrich et al., 2013; Manuti et al., 2018; Sankar et al., 2021). In that sense, that way defined so-called digital employees represent significant challenges and areas of intervention for the HR profession (Marler et al., 2016; Fenech et al., 2019).

As confirmed by researches conducted at the level of organizations, the fundamental challenges that HRM will need to address in the context of the application of digital technologies are, among other;

- The impact of digital trends such as cyber, data, cloud, social media and networking, and mobile devices (Kurek, 2021).
- A multi-generation workforce (Sima et al., 2020).
- Hyperconnected employees with integrated work and lifetimes
- Emergence of digitally qualified employees, ie digital citizens (Götz et al., 2020)
- The emergence of business models that have to deal with the challenges of digital disruption (Demartini et al., 2018)
- An employee becomes a consumer of an employer's brand

According to Rimon (2017), six main elements will characterize the perspectives of digital transformation of HRM;

- The consumerization of HR systems - employees will use HR processes as consumers, not just as employees.
- Establishing a digital employee-manager dialogue (Mirković et al., 2019).
- The transformation of learning (Fenech et al., 2019).
- Influence on goal setting (Selmer et al., 2004).
- Efficiency of feedback due to the application of digital transformations using analytical solutions (Demartini et al., 2018).
- Analytics - in-depth analysis, presenting immediate insights into actions for managers and HR professionals (Rimon, 2017).

For the digital transformation to be successful in the domain of responsibility of the HRM function, the participation of employees, managers, and other stakeholders and acceptance of the changes brought by the application of new technologies is crucial. In doing so, HRM processes must be harmonized with the overall

organizational strategy and goals in the field of digital transformation (Manuti et al., 2018; Cichosz et al., 2020; Kurek, 2021).

Recently, the principles of digital transformation are applied to both organizations and their employees. Organizations are in search of talents to make recruitment and selection processes as simple as possible, and therefore initiate fact-gathering processes on how digital technologies and tools affect employees (Rashid, 2017; Fenech et al., 2019; Am et al., 2020).

Digital transformation enables mobility and remote work. In that respect, cloud computing offers off-premises applications, and therefore mobility and remote working are becoming standard for many organizations (Ulrich et al., 2013; Ancarani et al., 2018; Am et al., 2020; Kurek, 2021). Various digital tools for work and reporting are available to employees, while managers are given the freedom to seek and recruit employees with adequate qualifications and skills regardless of their place of residence (Schwanholz et al., 2018; Cortellazzo et al., 2019; Sankar et al., 2021). Successful and fluid communication in these working conditions is enabled by various digital tools - social networks, intranets, e-mail and instant messaging applications, forums, VoIP, etc. (Fenech et al., 2019; Gong et al., 2021).

Digital transformation also provides superior features of employee analysis and reporting but also enables performance measurement and prediction of employee activities that were previously difficult to record, greatly improving interaction and collaboration with HR professionals and organization management (Selmer et al., 2004; Marler et al., 2016; Demartini et al., 2018). The use of digital tools has a positive effect on the optimization of work processes and enables the faster and more efficient achievement of organizational goals.

Conclusion

Mobility and remote working as significant consequences of the introduction of the digital transformation process have proven to be very successful, so organizations will build hybrid work models based on the intensive application of digital tools that support remote working and thus achieve increased productivity and efficiency. The role of the HRM function in this context will relate to the transformation of jobs and organizational structures and their adaptation to new standards and the need to increase operational efficiency. Digital transformation will enable the creation of a very flexible organizational structure and, accordingly, open space for the effective transfer of workers.

The discussed processes will lead to the creation of organizational forms whose basic characteristics will be flexibility, scalability, and adaptability to new uncertain business conditions. HRM will play a very important role in these processes with a focus on retraining and upgrading the knowledge and skills of existing employees, which will require the use of effective digital tools (big data analytics) and extensive reporting due to the need to map employee competencies.

The consequence of such trends will be that jobs will increasingly be designed for employees who possess transferable skills and can use them in a broader context. Digitization will enable organizations to design flexible work arrangements whose basic characteristics are flexible working hours and place of work.

From the conducted research, it became obvious that the digital transformation has made significant changes in the organization and the way employees work in the organization. The change is also reflected in the change in the role that HRM has played in measuring employee performance. the application of digital technologies enables the establishment of a performance management system that is oriented towards the evaluation of the achieved results of employees and not about the time

spent at work. It also implies the redesign of the employee appraisal system and its harmonization with new circumstances and needs arising from the implementation of the digital transformation process in the organization and especially within the HRM function.

Using big data analytics and AI for digitization of working places caused changes in the organization of work and working environment and adoption of modern working methods. The transformation of HRM driven by the use of modern digital technologies has also strongly impacted an organization's overall business performance.

Digital transformation processes in organizations have contributed to reducing the need for physical and repetitive work operations and created an increased need for a highly-skilled workforce. As a result of the application of digital technologies, the ways of hiring and selecting employees have changed. The digital transformation has conditioned radical changes in the organization of work, but also the functioning of the organization at all levels.

It should be noted that in the context of digital transformation, not all organizations see the need to introduce modern digital solutions. The reason for this can be found in the specifics of organizational culture as well as employee resistance to change. There is evidence in the available literature that the application of digital tools based on artificial intelligence is not always the cause of staff reductions, but maybe a reason for better utilization and advanced management of employee knowledge and skills

Although digital transformation introduces many positive perspectives, uncritically insisting on change can cause negative effects and jeopardize the achievement of optimal results. It is very important to detect possible risks related to information security, data access, and confidentiality and to find strategies to reduce or eliminate security threats by improving infrastructure and security processes.

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