

Impact of artificial intelligence and digital HRM on the resource consumption within sustainable development perspective

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Abstract. The paper examines the correlation between artificial intelligence (AI) and digital human resource management (HRM), their impact on sustainable development. It explores the growing importance of sustainable HRM and its integration within business processes. The study investigates how AI and digital HRM contribute to sustainable HRM practices and analyses influencing factors. It has been proven that many companies are wary of AI and digital HRM impact on sustainable HRM, facing integration challenges. The conclusions reveal that AI and digital HRM help addressing social issues spreading in today's world. Large corporations strive to implement them to achieve sustainable development goals. Strategic HRM focuses on strategy and human resources, while sustainable HRM emphasizes the connection between sustainability and HRM practices. To gain a deeper understanding of digital HRM, a survey on "People's vulnerability to human trafficking and exploitation in the context of war" was conducted. The findings show AI's potential to influence societal behaviour, highlighting its importance in shaping sustainable HRM. The practical implications of this research can aid enterprises in stabilizing their resource consumption. Economic growth, social inclusion, and environmental protection are essential interconnected elements for achieving sustainable development and ensuring the well-being of individuals and society.

1 Introduction

Nowadays, economic and population growth are occurring at breakneck speed, resulting in an increasing human impact on the environment and a significant imbalance in social dynamics. In response to the overexploitation of natural resources and environmental and social crises, the concept of sustainable development emerged. Sustainable development means work using principles of circular economy, that plays an important role towards sustainable business management and its implementation is beneficial for the enterprise or

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company, for consumers, communities and the state as a whole. The advantages of the circular economy include reducing the consumption of raw materials and energy resources, reducing the negative impact on the environment, minimizing waste, and stimulating innovation, that are tangential to sustainable development.

Sustainable development aims to eliminate poverty, reduce inequality, promote the sustainable management of natural resources and ecosystems, and foster inclusive and equitable economic growth. Essentially, it involves meeting the current needs without compromising the ability of future generations to meet their own needs. The goal of sustainable development is to ensure a secure future by preserving Earth's resources. For instance, countries adopting sustainable development approaches can effectively address the challenges associated with climate change, thus safeguarding limited natural resources for future generations.

To achieve sustainable development, three essential elements must be integrated: economic growth, social inclusion, and environmental protection. These interconnected elements are crucial for the well-being of individuals and society as a whole.

So, sustainable development must be a fundamental aspect of future visions. It should be deeply ingrained in the business strategies of enterprises and actively pursued to realize their goals if we wish to leave a livable world for future generations. It is worth noting that many organizations, particularly international corporations, now prepare Certificate Signing Request or Sustainability reports, indicating their concern and commitment to the future.

Furthermore, it's worth to take into account the current trends in the society development in the context of globalization movements, digitalization, artificial intelligence and the ethics of its use in certain business processes. That is why nowadays the direction of how artificial intelligence and digital human resource management impact sustainable development is pretty valuable.

2 Literature review

Topics connected with sustainable development, artificial intelligence and digital human resource management (HRM) both are highly discussible these days. So, there are lots of scientists who were trying to make deeper knowledge in this sphere. We are going to go through only with the works, that shows the most interesting and grounded researches.

First of all, it's very interesting work of Kramar [1] about sustainable human resource management. This article identifies six characteristics of Sustainable HRM which explain the divergence with SHRM and DHRM. Strohmeier [2] develops a terminology and typology of digital HRM, aims at a conceptual clarification of digital HRM and related concepts. However, he is concentrating more on digital organizations.

Big research that aims to analyse the effects of COVID-19 on the triple bottom line (TBL) of sustainability to support the future sustainable development agenda was conducted by Ranjbari et. al in 2021 [3]. Dantas et. al. [4] investigate how the combination of circular economy and Industry 4.0 can contribute towards achieving the sustainable development goals. Küpper et. al. [5] investigated an integrating framework and research propositions for a new HRM approach in the digitized economy.

Further Meijerink et. al. [6] obtain the necessity of algorithmic human resource management through synthesizing developments and cross-disciplinary insights on digital HRM. In some way it's correlated with the research of Parry & Strohmeier [7] – HRM in the digital age-digital changes and challenges of the HR profession.

Artificial intelligence in human resources management was also investigated by Tambe et. al. [8], Gunning et. al. [9], Vrontis et. al. [10]. Before these researches it's also important to mention that it was an investigation connected with understanding opacity in machine

learning algorithms [11] and an empirical study of the rise of big data in business scholarship [12], which gives a good background for understanding future details.

There is also a very interesting work of Bilali [13], but he makes the main point on the sustainability transitions. Latif et. al. [14] have made research connected with digital banking transformation. After the European Union has announced the European Green Deal, it's also important to investigate such direction as green economy and sustainable development. The role of the knowledge diffusion process in employment effects of sustainable development investments for large international firms was analyzed by Aldieri et. al. [15]. In this case, interesting is also a work of Maitah et. al. [16], who were analyzing income differentiation as a factor of unsustainability in forestry; the work is also related to the environmental policy, which is defined by the EU legislation as a set of objectives that aim to protect the environment, which is also a part of the sustainable development policy.

However, there remain numerous debatable questions, particularly regarding the successful integration and alignment of economic development and sustainable development, as well as the intersection of artificial intelligence and digital HRM.

3 Methods

The object of this research is the investigation of such categories as artificial intelligence (AI) and digital HRM, and their interconnection with sustainable development. The paper is based on a systematic review. To address the research questions and achieve the main aim of the study, a systematic approach to review the literature is employed. Research methods encompass a collection of theoretical, methodological, and applied considerations involved in defining and exploring a particular topic, development and actuality of combination of sustainable development and economic outfits that are changeable in accordance with influence of AI and digital HRM. Scientific articles related to these areas were thoroughly analysed, facilitating the formulation of informed conclusions for future research. So, system analysis has been used to understand what sustainable development is and how it's connected with such categories as artificial intelligence and digital human resource management. Using synthesis, a number of conclusions were made to create a clear concept of this interconnection. Using the analysis, a logical sequence of factors and their interrelationships was established within the entire sustainable development model under nowadays circumstances.

The purpose of the study is to examine the unique characteristics of how artificial intelligence and digital HRM impact sustainable development.

4 Results and discussion

The utilization of Earth's resources has reached unprecedented levels, despite their limited availability. Sustainability entails the responsible and efficient use of these resources. It emphasizes the importance of not compromising the well-being of fellow citizens in other regions or that of future generations.

Dealing with social issues is a fundamental aspect of the sustainable development concept. Currently, there are challenges in meeting people's basic needs such as education, clean water, sanitation, poverty alleviation, gender equality, and more. Furthermore, consumers are increasingly conscious of the importance of sustainable products.

4.1 Sustainable HRM as a Part of Sustainable Development

When discussing sustainable development and HRM, it is important to mention sustainable HRM as a specific direction within the broader framework of sustainable development programs. While sustainable HRM has been in existence for over 15 years, it remains relatively unfamiliar in many countries. This approach is built upon the foundations of strategic HRM, which emerged more than 35 years ago. Sustainable HRM focuses on achieving positive economic, social, human, and environmental outcomes concurrently, both in the present and for the future. The distinction between these two categories lies in the fact that strategic HRM deals with strategy and HRM, whereas sustainable HRM emphasizes the connection between sustainability and HRM.

Sustainable HRM acknowledges the crucial role played by HRM in fostering social outcomes, including the creation of social capital and potential for social health and wealth beyond the organization [1].

This necessitates active engagement and participation of employees, HR practitioners, as well as senior and middle managers. Organizations that actively gather employee feedback experience a significant decrease in employee turnover rates, among other advantages. Effective employee feedback enables companies to collect relevant data that enhances overall employee productivity. While positive employee feedback is often sought after, it is important to recognize the value of both positive and negative feedback. Additionally, implementing a comprehensive employee evaluation matrix can contribute to improved communication and better comprehension of the ongoing personnel situation among managers and employees [17]. In essence, contemporary HRM should serve as a guiding framework for managing individuals in a manner that advances sustainability objectives through a collaborative, multi-stakeholder approach at various organizational levels.

4.2 Digital HRM: Case Study

Furthermore, contemporary trends highlight the significant role of digital technologies in establishing sustainable HRM practices by reducing costs, saving time, and enhancing productivity. These trends reflect the broader impact of digital transformations on management approaches, incorporating the Internet of Things, artificial intelligence, blockchain, machine learning, Industry 4.0, and Big Data across various societal domains. Digital HRM represents a fundamental component within the overarching framework of sustainable HRM, as the attainment of sustainability goals is inherently intertwined with embracing digitalization [18].

The integration of digital technologies within HRM facilitates organizational optimization, efficient resource allocation, and data-informed decision-making. This integration aligns HRM practices with sustainability objectives, resulting in enduring positive outcomes. Notably, digital technologies enable cost reduction, time efficiencies, and heightened productivity, which collectively contribute to the overall sustainability of HRM practices.

Recognizing the symbiotic relationship between digitization and sustainability, it becomes evident that achieving sustainability goals necessitates the proactive adoption of digital advancements. Digital HRM, as an essential subset of sustainable HRM, underscores the critical role played by digitization in promoting sustainable outcomes. Thus, incorporating digital technologies into HRM practices assumes paramount importance in driving sustainable practices and fostering organizational prosperity within the dynamic digital landscape.

Digital HR encompasses the development and transformation of HR services and processes using social, mobile, analytical, and cloud (SMAC) technologies. It encompasses a diverse range of phenomena, encompassing various applications such as streamlined HR payroll accounting and sophisticated Human Resource Analytics (HRA) approaches, all of which exemplify digital HRM [2].

The implementation of digital HR includes various examples, such as:

1. Utilizing specialized systems like Applicant Tracking Systems (ATS) to conduct automated analysis of applicant CVs. These systems employ keywords and data on high-performing employees to filter out unsuitable candidates for specific positions.
2. Automating and digitizing recruitment processes to streamline and enhance the efficiency of hiring procedures.
3. Employing big data for career growth planning, employee rewards, and identifying skills and education gaps. This information can be utilized to provide training opportunities and ensure employees acquire the necessary skills in a timely manner.

Now, let us delve deeper at the macro-level, using Ukraine as an example. In the period between July and August 2022, the International Organization for Migration conducted a survey entitled "People's vulnerability to human trafficking and exploitation in the context of war" in collaboration with the "Mission in Ukraine". The survey was conducted via mobile phone interviews and gathered responses from 5077 participants, providing insightful statistical data (Fig. 1).

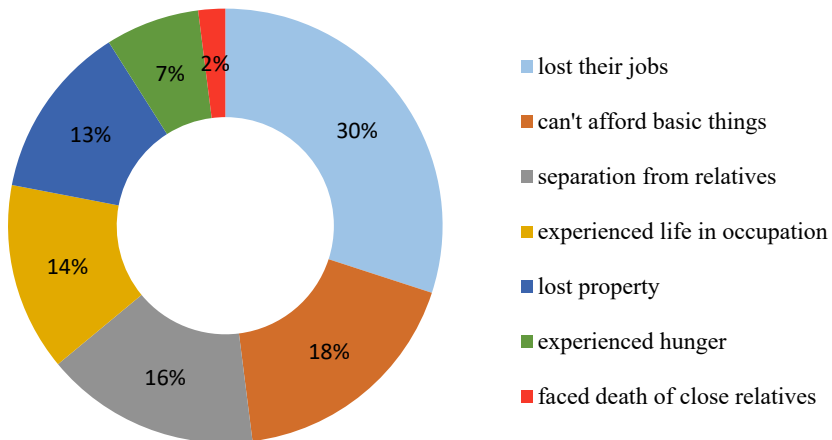


Fig. 1. The survey results revealed the prevalence of certain challenges experienced by individuals.

Nowadays, the term "resilience" has become increasingly prevalent in describing the position of local businesses. Many entrepreneurs have successfully navigated through multiple economic crises, the 2014 invasion, and the COVID-19 pandemic. As a result, crisis management has become a familiar concept for business owners. However, they still encounter challenges within their HR systems. Some difficulties arise from the complexities of remote work, as not all individuals are equipped to work from home. Conversely, there are individuals who prefer to continue working remotely, while others face time zone disparities across different countries. In such circumstances, digital HRM plays a crucial role in maintaining operational continuity.

A certain percentage of Ukrainian organizations unfortunately did not survive the aforementioned crisis [19]. However, most companies made efforts to support their employees during the initial stages of the full-scale invasion in 2022.

The implementation of mental health strategies and support programs commenced approximately 1-2 months later. The experience of a Ukrainian co-founded IT company, "Genesis", provides an illustrative example of such measures. Genesis was established in 2008, with its initial product being the Ukrainian social network, Connect.ua. In 2012, Genesis successfully launched news media platforms in Nigeria and Kenya: Legit (formerly Naij.com) and Tuko.

At present, the majority of employees are based in Ukraine, resulting in increased levels of stress and depression. To address this, the HR department has introduced new initiatives. Every 3-4 months, project teams retreat to countryside cottage houses for a weekend, engaging in trainings, team-building activities, open discussions about concerns, desired changes. Additionally, a weekly gathering is organized at the office to bring together both in-office and remote employees. There is a growing emphasis on encouraging employees to apply for various courses and training programs, with the company covering 70% of the costs. Basic gym memberships are fully covered to promote physical well-being. Projects are actively working on establishing common values and guiding conversations that align with these values, facilitating agreement and mitigating potential conflicts. So, despite all the risks, companies are forced to further develop and automate their HR processes [20]. Based on research, it has been found that nine out of ten companies have implemented automation in their HR processes to some extent. This automation has led to the optimization of payroll accounting and human resources management in almost half of the cases. Additionally, around a third of the companies have simplified internal communication, and a quarter of them have improved their recruitment efficiency.

Furthermore, one in seven companies utilizes computer and internet technologies to obtain more accurate HR analysis. Similarly, nearly the same proportion of companies has the opportunity to assess and train their staff more effectively, including remote training options. This approach enables maximum outreach to employees while minimizing costs for the employer.

4.3 Influence of Artificial Intelligence in Digital HRM on the Sustainable Development

Artificial Intelligence (AI) plays a significant role in contributing to sustainable development by enhancing the prediction of errors and facilitating effective planning of Sustainable Development Goals (SDGs). The integration of big data and AI technologies has revolutionized various aspects of our lives, work environments, and business operations. Unsurprisingly, it has also had a transformative impact on human resource (HR) management [21]. The utilization of AI technology enables us to construct more efficient systems, promote sustainable resource usage, and effectively reduce and manage waste generation, among other important considerations [22]. By harnessing AI's capabilities, organizations can optimize their operations, make data-driven decisions, and implement sustainable practices that align with the broader goals of sustainable development.

AI's ability to analyse vast amounts of data, identify patterns, and generate valuable insights enables us to make informed decisions and take proactive measures to address environmental, social, and economic challenges. This includes areas such as energy management, waste reduction, supply chain optimization, and resource allocation. With AI's assistance, we can develop strategies and implement measures that contribute to the achievement of sustainability targets and create a more sustainable future. This may involve making strategic decisions based on the analysis of HR data using artificial intelligence (HR analytics), for instance. Therefore, digital transformation in HRM always incorporates a strategic component, allowing organizations to capitalize on the opportunities presented by digitization and drive meaningful advancements.

New and unique process roles are emerging within HR departments. These roles include bottleneck specialists who focus on optimizing processes, identifying bottlenecks, and addressing process weaknesses, emerging green jobs. Transformation specialists play a crucial role in developing a culture that promotes change and flexibility [23]. Considering the current state of technology, it is unlikely that the process of acquiring new knowledge and skills by employees can be completely automated. AI, as it stands today, cannot fully replace humans in this process. However, nowadays, the HR area, particularly in recruiting, has seen a significant increase in the use of AI tools. These tools offer several advantages to professionals, including improved work quality, reduced bias, and faster and more diverse candidate searches. Many large corporations utilize AI tools in various areas, such as:

- AI in education – Thync, Affective Signals, Rescue Time, etc.
- AI in recruiting – Chat boxes, Magnet.me, Entelo, Seedlink, Brilint, Crystal, etc.
- AI in operational work – SATMAT, Amelia, LYREBIRD, etc.
- AI in change management – Hitachi Business Microscope and Humanyze, Veriato 360, OrgMapper, etc.
- AI in compensation and benefits – PayScale, Paysa, etc.
- AI in conducting surveys – ViTA.iO, Workometry, Peachy Mondays, etc.

These AI tools have proven to be valuable in enhancing HR processes and improving overall efficiency and effectiveness. Artificial intelligence can enhance production processes, making them more efficient and economical while also promoting sustainability. Research conducted at the Center for the Advancement of Artificial Intelligence in Stuttgart demonstrates how AI can contribute to reducing greenhouse gas emissions, as well as optimizing resource and energy consumption [24]. By leveraging AI technology, organizations can streamline production processes, improve resource utilization, and minimize waste. Additionally, AI algorithms can analyse data to identify inefficiencies, optimize energy usage, and make informed decisions that align with sustainability goals. AI-powered solutions can also monitor and control environmental factors, such as air and water quality, for effective environmental management. Overall, AI offers significant potential for achieving sustainability objectives in various industries.

5 Conclusions

Sustainability and "green growth" are the basis of the recently presented program of sustainable development. Europe has embraced the future of green jobs and technology, recognizing the potential for millions of opportunities in line with the goals of the 2030 Agenda for Sustainable Development. The focus on transitioning to a decarbonized economy, which prioritizes environmental friendliness, and the promotion of the circular economy, emphasizing reuse, repair, and recycling, are key drivers for the creation of these green jobs. This shift towards sustainable manufacturing and consumption is crucial for the overall goal of achieving a more sustainable and eco-friendly society. However, while sustainable development offers numerous advantages, it is not without its critics. Some view sustainable development as a utopian concept due to the perceived impossibility of achieving equality within a society that is inherently divided by class. Additionally, the implementation costs associated with sustainable development and the absence of a centralized body to ensure its effective implementation further contribute to the criticisms labelling it as "utopian".

However, it is crucial to recognize that sustainable HRM plays a pivotal role in transformative change processes and encompasses action learning initiatives that positively impact the well-being of employees and society as a whole.

Despite the challenges and criticisms, sustainable HRM remains an integral component of fostering positive change and promoting the overall welfare of individuals. Today, it is simply impossible to imagine the full functioning of a sustainable enterprise management system, including HRM system, without a number of electronic and online services (chatbots, social networks, automated systems, etc.).

The use of social networks, AI-based applications, automation, and cloud technologies in human resources management has proven effective in improving efficiency, implementing strategies, and influencing businesses. However, the widespread adoption of artificial intelligence has sparked global debates regarding discriminatory effects, opaque decision-making and optimization processes, and the perpetuation of social inequality. The increasing discussion revolves around the energy consumption and greenhouse gas emissions associated with the development and application of AI models, as well as the significant implications for labour markets, consumption patterns, and the market power of large companies. These discussions highlight the ongoing relevance and the need for further research on topics related to artificial intelligence, digitalization, and sustainable development, especially in terms of their interconnectedness.

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