

A study on the correlation between Human Resource Management and Organizational Sustainability in the Context of Industry 4.0: A Review

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ABSTRACT

The aim of the present study has been to analyze the ways in which Industry 4.0 impacts HRM functioning, its impact on organizational sustainability and the association between organizational sustainability, HRM in context to Industry 4.0. The findings of the paper indicate that Industry 4.0 and associated advancements would contribute to the HRM functioning to a significant manner, by automating various repetitive tasks. It is also expected to positively impact the workforce by automation repetitive tasks, giving the workforce to demonstrate their talent and skill set which would add value to the organization. However, for Industry 4.0 and associated advancements to be an aid for the growth and development of the workforce, the role of HR managers is integral, because, automation of various processes within the organizations would only result in the employees to be irreplaceable when the HR managers and organizational leaders promote a culture for knowledge sharing, which would in turn result in the employees to adapt to the organizational changes.

Keywords: Human Resource Management, Organizational Sustainability, Industry 4.0, fourth industrial revolution

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1. INTRODUCTION

The process of digitalization across different industries and service sector has resulted in transforming the workplace and human resources. The incorporation of disruptive technologies related to 4th industrial revolution also referred as Industry 4.0 has resulted in reshaping the way in which individuals learn, work, manage, lead, interact and recruit others (Gajdzik & Wolniak, 2022). In this context it is mentionable that the concept of Industry 4.0 can be defined as elevation in the amount of digitalization across the entire value chain and a possible structuring of data transfer among systems, objects and people in real time. It can also be referred as a phenomenon which gives specific emphasis to the constant need of organizations for change in attitude of employees, their mindsets, and behavior to their own environment which is volatile in nature. Considering the significance of workplace in the effectiveness of digital transformation it is essential to understand the concept and changes required in the arena of human resource management (HRM). The concept of traditional HRM refers to the process of managing resources or individuals in an organization and comprises of every techniques which is implemented for the purpose of management of individuals in the organization, keeping them qualified, updated, and coordinated with the expectations of stakeholders, wherein the emphasis is also on activities associated with professional training, learning, and qualification of individuals associated with the organization (Mahapatro, 2022). It also focuses on specifying the organizational structure, developing social and ethical principles and enhancing communication. As already specified, that the process of digitalization in the organizations results in volatile situation, and major organizational change, the aspect of organizational sustainability becomes integral in this context. Organizational sustainability implies having the leadership, global insights, talent and change strategies which are integral to rise to the specific challenges facing organizations in the present time (Benn et al. 2014). It refers to any strategy for attaining sustainability from economic, social and environmental dimensions within an organization (Baumgartner, & Rauter, 2017). Thus, the focus of the current study would be on analyzing the association between HRM, organizational sustainability in context of Industry 4.0.

2. REVIEW OF LITERATURES

Human resource management (HRM) in the context of Industry 4.0

According to the study conducted by Silva et al. (2022), based on the transformations induced by the Industry 4.0 and associated technological advancements, it is essential to understand the ways in which its changes have resulted in impacting HRM, along with the application of digital technologies to their functioning. According to the study conducted by Sulej (2020), it has been opined by the researcher that Industry 4.0 is not simply an extension of 3rd Industrial revolution; rather it is a new and distinct revolution. It has resulted in the introduction of technologies in the workplace which has resulted in blurring the difference between the biological, digital and physical arenas across all the sectors. It has also been opined in this alignment that technologies like nanotechnology, artificial intelligence, robotics among other technologies would result in drastically surpassing any digital advancements which has been made in the last 60 years and result in formulation of a reality which was previously beyond one's imagination. In this alignment in the study conducted by Hinton (2018), it has been opined by the researcher that such profound realities would result in alteration and disruption of business model of all the industries. Such changes are applicable to every arenas of performing work. In the opinion of Latham (2017), the underlying reason behind this is because organizational system does not subsist in the absence of human. According to Sulej (2020), it is because of the mentioned reason, HRM can be considered as the major management area. It includes activities such as selection and recruitment, HR appraisal, training and development and career management. In the study conducted by Whysall et al. (2019), the extent to which technological changes are brought by Industry 4.0 have resulted in developing a major gap between the existing skill set and capabilities of employees and the drastically evolving nature of their job roles have resulted in promoting the requirement to consider innovative and more effective approaches to human resource development. In regard to the challenges posed by Industry 4.0 on HRM, in the study conducted by Liao et al. (2017) it has been stated that because of the changes brought in by Industry 4.0 an increased level of emphasis has been given on "the concept of IT integration" for instance, "horizontal connection of IT systems and vertical, company-wide connection of IT systems". Sulej (2020) highlighted in this regard that formulation of demand for labor is the most commonly discussed issue, which integrates technological innovation with labor market. In the study the concept of technological unemployment has been referred which is the unemployment, the underlying reason behind which is innovation of ways to economize the application of labor exceeding the pace at which new uses for labor can be found. In this alignment, in the study conducted by Sulej (2018) the findings of the study has indicated that the number of jobs for individuals who are unqualified would be decreased in the future on the other hand, the demand for highly competent individuals would be on a rise. In the study conducted by Hinton (2018), it has been estimated that because of major advancements in automation approximately 375 million workers would be required to change their occupation category. On further analyzing the impact of Industry 4.0 on HRM McGowan (2018) opined that there are three alternative scenarios or impacts of this technological advancement on the future workforce. One the scenario or impact would be automation would result in optimization of the functioning an organization. It has been considered as the ideal impact of automation wherein technological advancements like that of artificial intelligence and robotics would serve two purposes which would be the expansion of the enterprise and to serve the workforce. The use of automation and advanced data by companies for these ends would result in Industry 4.0 to optimize the future of work, and to enhance rather replace employment opportunities and conditions (Wilkesmann, & Wilkesmann, 2018). In this alignment in the study conducted by Hecklau et al. (2017) it has been opined by the researchers that because of the technological advancements caused by Industry 4.0, there would be requirement of developing virtual communication skills among the workforce because of increase in virtual work. According to the study, it would also require the employees to be able to recognize the sources of error and be able to enhance processes. Furthermore, the need to perform virtual work on platforms or servers would also result in making it essential for the employees to be aware about cyber security. The increase of digitalized processes would also result in developing an elevated need for employees to understand and be able to write code. The increase in process complexity also results in demanding an increased, deeper process understanding, acting and thinking in cross cutting and networked processes. In addition to that, the increase in complexity of work also results in the need for employees to develop various competence knowledge and skills.

While discussing the impact of Industry 4.0, in the study conducted by Sulej (2018), the researchers also discussed another probable impact of Industry 4.0 on HRM, wherein the corporation would replace automation as a priority for Industry 4.0. In case of such an impact, the workforce of the organization would have a say. In this scenario, the organizations are encouraged to engage the workforce rather than alienating them. It promotes the involvement of governments and labor organizations in the development of new workforce strategies in an integrated manner. The third impact would be digital transformation leading the workforce transformation. In this scenario automation would find its own expertise level. In the opinion of the researchers, this level of expertise may exceed the ability of human in various cases, however, human skill sets is not devalued in such circumstance. In case of such an impact of Industry 4.0 on HRM, there is a major argument that particular human skill sets would turn out to be more significant in Industry 4.0. In the study conducted by Sivathanu & Pillai (2018), the researchers opined that the development of new technologies for instance artificial intelligence would result in automation of majority of the HR processes which would result in changing HR services into "Smart HR concept". In this regard, the concept of "Smart Human Resources 4.0" [SHR 4.0] has been discussed and emphasized by the

researcher which is the digital transformation of the HR functions of learning, on boarding, recruitment and development. In this alignment in the study conducted by Ana et al. (2019), it has been stated by the researchers that new aspects associated with HRM 4.0 would result in having major consequences for training in proficiencies that are needed for workforce 4.0 and new profiles of job which have been developed because of such advancements. In the opinion of Flores et al. (2020), the new talent and human resources of the future would need the development of more creative, coordinated and strategic activities and lesser easy and repetitive activities because of such technological advancements, which would allow the workforce to demonstrate their skills in activities which add more value. Due to the mentioned change in operation of workforce, traditionally, the tasks which were performed manually and required individual analysis would become automated, and would also the workforce to analyze significant volume of data precisely, intelligently and within a short period of time. In the study conducted by Silva et al. (2022) it has been opined in this regard that the technological advancements as a result of Industry 4.0 are implemented in HRM tasks for the purpose of enhancing management process. In tasks like resume selection, selection of profiles with a high scope of addressing job requirements, technological advancements like AI and big data would be beneficial, which were traditionally performed in a manual process. Abdeldayem & Aldulaimi, (2020) also mentioned in this context that HRM functions such as career plan development, which focuses at recognition of the right skills and measures of keeping the workforce qualified, motivated and developed, are also benefited by the application of AI as a learning and management system. In context to the impact of Industry 4.0 on the functioning of HR managers, in the study conducted by Ammirato et al. (2023) it has been opined by the researchers that the shift to HRM 4.0 is a complex process, which requires reassessing HRM processes themselves, comprising of various sensibilities and competencies for HR managers. In the opinion of the researchers, the HR managers are required to gain expertise in Industry 4.0 technologies, for the purpose of gaining information from the workforce as well as to make the collected information valuable and insightful for HRM. With these advancements, in the opinion of the researchers, the HR managers are turning out to be the guardians of well-being of employees as they are positioned over the balance between “digital technology” and “human” elements of the work. The evaluation of human well-being is turning out to be integral for HR managers for the purpose of digitalization of the company in context to timing as well as intensity. HR managers, in this regard are required to adopt performance management models and measurements, which allows the reframing of new concepts. The HR security related issues and related vulnerabilities has turned out to be a major concern for top manager, because of constantly increasing “intra- and inter-connection of workers”. The mentioned issue and associated challenges are witnessed at the higher level of an organization.

3. ORGANIZATIONAL SUSTAINABILITY AND INDUSTRY 4.0

In context to Industry 4.0 and organizational sustainability, in the study conducted by Mayer & Oosthuizen (2022), the researchers opined that Industry 4.0 requires new practices with the businesses that emphasizes on sustainability and positive impacts. Increasing interest can be noted in organizations in regard to the application of Industry 4.0 for attaining sustainability. In the study conducted by Beltrami et al. (2021) focus has been given on the similarities between organizational sustainability and Industry 4.0, specifically the impact of technological advancements associated with Industry 4.0 on organizational sustainability practices and associated outcomes. For organizations Industry 4.0 and sustainability are integral concerns. In the opinion of these researchers, in the context of three major pillars of sustainability the impact of Industry 4.0 is needed to be considered which includes social, environmental and economic, for industrial organizations. In the opinion of Lu (2017), Industry 4.0 has initiated to revolutionize communities that require major up gradation, which transcends the aspect of technological up gradation. In the study conducted by Martínez-Jurado & Moyano-Fuentes, (2014), the researchers states that companies which implement Industry 4.0 for enhancing their results also desires to be considered as socially responsible. The researchers stated that organizational sustainability is considered as the new Industry 4.0 frontier. For the economic survival of any organization, cost-saving and productivity is essential. However it is required to attain these tasks in a sustainable manner by mitigating adverse social and environmental impacts and in turn contributes to sustainable society. In this alignment, in the study conducted by Jabbour et al. (2013), it has been stated that when companies implement Industry 4.0 practices, environmental management practices tends to be greater, which would contribute to the enhancement of the environmental performance. In the study conducted by Ng et al. (2015), as well, it has been indicated that implementation of Industry 4.0 results in minimizing environmental impact and enhance environmental benefits. The findings of the study conducted by Mayer & Oosthuizen (2022), also indicated that organizational sustainability in Industry 4.0 business practices is formulated through the integration of collecting the human touch and advanced 4IR technology. The findings of the study has demonstrated sustainable business practices are attributed to the implementation of Industry 4.0 technologies, for instance AI, automatization, robotics, among others and advanced technologisation processes.

4. ORGANIZATIONAL SUSTAINABILITY PERFORMANCE, HUMAN RESOURCE MANAGEMENT PRACTICES AND INDUSTRY 4.0

In regard to the association between organizational sustainability performance, HRM practices and Industry 4.0, in the study conducted by Rana & Sharma, (2019), the researchers opined that sustainable development of Industry 4.0 in a way which is socially responsible would require on the end of the HR to promote a change in the organizational culture along

with the cultural mindset of the employees, at the same time protecting the effectiveness and well-being of the workforce. In the opinion of the researchers, HR departments would be able to attain sustainable and socially responsible changes by supporting the Industry 4.0 benefits in which the technology allows for work-life balance, mobility and flexibility of the employees. HRM can also contribute in the socially responsible and sustainable digital development by promoting a learning culture and developing the process of knowledge sharing and networks within the industry. In the opinion of Li et al. (2019), knowledge sharing by the workforce can be integral in the implementation of Industry 4.0. It is because of the mentioned reason; socially responsible HRM focused on generating value for employees will develop knowledge sharing, respect and trust. It would contribute in speeding up the pace of change in a sustainable and inclusive manner. In the opinion of Rana & Sharma (2019), one of the core functionality of HR departments is to support team learning and it can be enabled by the HR professionals with the help of developing systems which are supportive of and acknowledges knowledge sharing among the workforce. An organizational with learning environment can integrate new knowledge and learning effectively at every level within the organization which includes organizational, team and individual level. The mentioned approach can be developed by the HR professionals for supporting learning culture resulting in sustainable and effective transitions to Industry 4.0 smart manufacturing. In the study conducted by Mukhuty et al. (2022), it has been further specified by the researcher's that socially responsible HRM can play an integral role by providing "employee-oriented in-house learning", targeted mentoring, development coaches, and external consultancy support. They also can support the process of reverse mentoring, in which generation Y and Z employees would be responsible for mentoring the older workforce in becoming digitally competent. In the opinion of the researchers, such "socially responsible employee-centric HR practices" would contribute to generating organizational citizenship, employee commitment, which would act as a contributing factor in the vision of sustainable development of Industry 4.0.

5. METHODS

Inclusion criteria

In regard to the criteria for study selection, focus has only been given on the selection of studies, which focuses on HRM, organizational sustainability in regard to Industry 4.0. Studies which focus on the mentioned arenas have only been selected for this review. Studies, which have been published between 2013-2023 have been considered and which have been published in English.

Exclusion criteria

Studies which focus only on, various advancements associated with Industry 4.0, or individually discuss the concepts of HRM and organizational sustainability have not been included in this study. In addition, any study published prior 2013, or in any other language other than English have not been included in the study. In addition any study, which has been published in unauthenticated sources have also not been included in this study.

Search strategy

Systematic literature search has been conducted in this study, wherein search for studies published between, 2013-2023 has been performed. With the help of the search strategy mainly in databases for instance Google scholar, ScienceDirect the required studies for this review have been collected.

Search strategy

Applicable studies for this review were selected by using a search strategy. The articles with appropriate topics were screened with the help of keywords associated with the study. Major information associated with the topic was extracted in the first step. Followed by this the available titles and abstracts were identified and analyzed for the purpose of revealing the rationale of the included studies that are present in the paper. Followed by that, the full-texts of the articles were analyzed in a detailed manner, wherein the articles were independently reviewed.

Data extraction

Data was extracted individually from each study. A common consensus was reached in this process. Aspects associated with HRM and Industry 4.0, organizational sustainability and Industry 4.0, and the correlation between organizational sustainability practices are some of the aspects associated with which, details have been extracted from the collected studies and presented in this review paper. The obtained outcomes on the basis of the information collected from the studies have been used for the purpose of generating concluding remarks for this study.

6. DISCUSSION AND CONCLUSION

Thus, based on the reviewed literatures in this study, it can be noted that Industry 4.0 and associated advancements may result in having different impacts on the HRM processes, which primarily would result in automation of repetitive tasks for instance, resume short listing. However, it can be inferred that the ways in which such advancements impact the workforce is largely dependent on the ways in which HR managers takes the implementation processes ahead. In case of promotion of an organizational culture in which knowledge sharing, the technological advancements would result in

positively impacting the productivity of the employees which would add value to the organizations. It would also result in contributing to organizational sustainability wherein the growth and opinion of the workforce are taken into consideration. Thus, it can be concluded that HR managers play an integral role in promoting HRM functioning, and organizational sustainability in context to Industry 4.0.

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