AI-SHRM: REVOLUTIONIZING HRM IN THE FOURTH INDUSTRIAL REVOLUTION

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Abstract

Industry 4.0 is expected to create a business environment where machines can imitate human intelligence and the various components of a company's value chain are connected through data. To gain a competitive edge, companies must prioritize strategic human resource management based on the "resource-based view of a firm" or "resource advantage theory". AI has the potential to improve efficiency in all aspects of HRM and is poised to become the new trend for HRM in the future. This paper presents a conceptual model for incorporating artificial intelligence into strategic management for Industry 4.0. It is based on the resource-based view of strategic human resource management (SHRM), which emphasizes the importance of aligning an organization's resources with its strategic direction and leveraging human capital to achieve sustainable competitive advantage. SHRM focuses on empowering employees and managing their careers, aligning them with corporate strategy, and transforming the workplace into a high-performance environment. Industry 4.0 faces social and economic challenges, such as a shortage of skilled workers, an aging society, cost reduction pressure, and a short product life cycle.

Keyword: Resource-based Vies, Business environment, Industry 4.0, Artificial Intelligence, Strategy

Introduction

Industry 4.0, also known as the fourth industrial revolution, is expected to create a business environment where machines can imitate human intelligence and the various components of a company's value chain are connected through data. This transformation will likely result in robots equipped with artificial intelligence performing tasks that humans previously carried out but with greater efficiency and accuracy. Consequently, companies must prioritize strategic human resource management since human capital will become a One of the most significant assets in the context of Industry 4.0 is believed to be of higher value, assisting businesses achieve and maintain a competitive edge. Artificial intelligence will drive Industry 4.0, with AI-powered machines forming most of the labour force. A concept of AISHRM Theoretical Framework, which represents "Artificial Intelligence-based Strategic Human Resource Management for Industry 4.0" and this particular model is designed on the principles of strategic human resource management. principles of the "resource-based view of a firm" or "resource advantage theory". Globalisation has created significant challenges for businesses due to the highly competitive marketplace resulting from increased interconnectedness at the global level and rapidly evolving customer expectations (Hecklau, Galeitzke, Flachs, & Kohl, 2016). Companies must prioritise innovation and technology adoption to gain a competitive

advantage over industry rivals. Sustainable competitive advantage lies in a company's human capital, rather than treating HRM as a mere procedural function (Wright, Dunford, and Snell 2005). Over the past 20 years, research has transformed traditional human resource management, (HRM) into a strategic management approach known as Strategic HRM (Yang & Lin, 2014). Strategic HRM defines the process of harmonizing HRM policies and align with the overall strategic objectives of an organization. In other words, coordinating recruitment, career development, compensation, performance management, employee relations, health and safety management with the organization's strategic plan. This alignment is critical for organizations seeking to gain a competitive edge through their human capital, as noted by (Yang and Lin 2014). To improve the efficiency of HRM activities, artificial intelligence has become a popular technology trend (Jia, Guo, Li, Li & Chen, 2018). The present era is marked by the advent of Industry 4.0, which entails the integration of individuals and technology through the utilization of enormous quantities of data. The process of data transfer will be streamlined through ongoing digitization efforts and the digitalization of the value chain, supported by the implementation of artificial intelligence. Within this organizational environment, machines and objects involved in organizational processes will be capable of independent learning and behaviour change (Hecklau, Galeitzke, Flachs & Kohl, 2016).

In Industry 4.0, the value chain of organizations will be heavily reliant on artificial intelligence, leading to the growth of sectors such as data science. Significant modifications to business models will be necessary to adapt to these changes, including the transformation of how strategic human resource management is carried out. HRM will not only be responsible for managing human work but also need to determine which tasks should be assigned to people and which should be given to machines (Liboni, Cezarino, Jabbour, Oliveira & Stefanelli, 2019). According to Barney's (1991) Resource-Based View or Resource Advantage Theory, Strategic Human Resource Management has been provided with an effective basis.

According to RBV theory, an organization can gain a distinctive and long-lasting competitive edge by aligning its talent acquisition and resource development strategies with its overall organizational strategy (Colbert, 2004). To put it differently, RBV highlights the importance of strategically managing an organization's resources, including human capital, to create a sustainable advantage over its competitors. To thrive in Industry 4.0, organizations should prioritize human capital development as a key corporate strategy. This involves implementing HR management approaches that align with the demands of Industry 4.0 and strategically utilizing HR functions such as training, hiring, settlement & performance appraisal, and job design to drive learning and innovation within the organization. By adopting these practices, organizations can ensure sustainability in the rapidly evolving landscape of Industry 4.0. These activities must be approached with a mindset of continuous development, incorporating learnings from past experiences and applying them to future iterations. This approach will enable organizations to stay ahead of the curve and remain competitive in the long run. Human Resource Management (HRM) activities aligned with corporate strategy can be enhanced through learning and knowledge management (Shamim et al. 2016). This, in turn, can improve the capabilities of individuals and the management approaches, creating a continuous cycle of improvement. According to (Jia et al. 2018), Artificial Intelligence (AI) pertains to algorithmic constituents that possess the capability to acquire knowledge from contextual and

environmental factors, improve decision-making proficiencies, and facilitate labor processing through analytics and knowledge bases. AI has the potential to improve efficiency in all aspects of Human Resource Management and is poised to become the new trend for HRM in the future. This paper aims to leverage AI based on the Resource-Based View (RBV) theory of SHRM to enhance SHRM for Industry 4.0.

Objective of the study
1. To study the integration of AI and SHRM
2. To study about importance of aligning an organization's resources with AI to gain a long-term competitive edge.

Research Question
1. How the Artificial Intelligence incorporating into Strategic Management for Industry 4.0.
2. How the organizations can better exploit resources to achieve strategic goals by incorporating artificial intelligence into strategic management

Literature Review

The field of AI in software engineering has been shaped by cognitive science, which has advanced through research in machine learning, NLP, robotics, and image processing (Lee et al., 2018). Recently the progress in AI's machine learning ability has led to significant algorithmic developments, making AI increasingly applicable to industrial applications (Jia Q et al., 2018). The significant progress in AI has brought forth a new phase of the workforce, where machines emulate human thought processes. The effectiveness of this innovative algorithmic technology can be gauged from the remarkable achievement of "Google Alpha GO" in defeating the South Korean chess player Lee Sedol. Before the emergence of Strategic Human Resource Management (SHRM), organisations practised Human Resource Management (HRM) as a distinct management function without incorporating it into their corporate or business strategy development. It was not until Jim Walker's suggestion in 1980 that human resource plans should align with the business strategy that SHRM gained attention. This marked a significant shift in how organisations viewed HRM's role in achieving strategic objectives. For strategic human resource management to be effective, it is necessary to align it with the company's overall corporate and business strategy. The primary contrast between HRM and SHRM is that, HRM, also known as technical HRM, involves traditional functions such as recruitment, training, career development, and performance evaluations. On the other hand, SHRM concentrates on empowering employees and managing their careers, aligning them with corporate strategy, and transforming the workplace into a high-performance environment that directly contributes to achieving company objectives (Yang & Lin, 2014). Industry 4.0 is the fourth industrial revolution driven by high-tech advances. This revolution is characterized by the seamless integration of people and machines through real-time data exchange along a digitized value chain. With the help of artificial intelligence, machines can learn human patterns and increase efficiency. Predictive maintenance (PdM) is considered a critical component of Industry 4.0. This system performs an analysis, prediction, and indication of machine maintenance. Implementing Industry 4.0 will facilitate a dynamic and adaptable setting for exchanging information between cyber-physical systems. According to "Industry

4.0" refers to the development of a cyber-physical system for production, which includes the integration of sensors into machines and the use of smart manufacturing throughout the supply chain (Shamim et al. 2016). The author stresses the importance of human resources in Industry 4.0 because the aforementioned activities require constant innovations, which can only be accomplished by skilled workers. When viewed from the perspective of human resources, industry 4.0 faces a number of social and economic challenges. Due to a lack of compelling recruitment strategies for the younger demographic, there is a projected shortage of young individuals in the labour market to fill the positions vacated by retiring employees. The younger generation entering the workforce places significant importance on work-life balance and the ability to work flexibly in virtual settings. Moreover, fostering a culture of lifelong learning is deemed an appealing attribute for retaining proficient and young and vibrant employees within an organization (Hecklau et al., 2016). Industry 4.0 includes modifications in interpersonal relationships, including human-to-human interactions and alterations in how individuals engage with organizations, innovations, and technology.

Discussion

As per the literature, Industry 4.0 is projected as a business environment where machines are interconnected with data and exhibit superior efficiency in the production process compared to human labour. It is predicted that autonomous robots will eventually replace human labour in various industries. Each occupation will necessitate a distinct skill set, making each job unique. According to Hecklau et al. (2016), certain skills will become more in demand, and the human resource management function must prioritize their development. The era of advanced and intelligent production, known as Industry 4.0, has its fundamental basis in Human Resource Management (HRM), according to Liboni et al. (2019). According to Sivathanu and Pillai's (2018) research, it is imperative that human resource management processes, such as recruitment and skill development, are in alignment with an organization's business strategy. The research paper highlights the significance of possessing problem-solving abilities for effectively handling the Internet of Things (IoT), Big Data, and Artificial Intelligence (AI) (Liboni et al., 2019). The author intends to use artificial intelligence to solve human resource difficulties in Industry 4.0, allowing organizations to gain a competitive edge from a resource-based perspective. Recruitment and knowledge management - as a solution to the industry's shortage of trained workers and an ageing workforce. In the context of Industry 4.0's business landscape, the optimal approach for Human Resource Management (HRM) is to prioritize the recruitment of highly skilled personnel to facilitate the organization's pursuit of sustainable competitive advantage, as Colbert (2004) suggested. The practice of submitting a paper-based curriculum vitae has been replaced by the utilization of online job portals and electronic formats, which the millennial generation has adopted. Electronic profile activities and data, including those on social networking sites like Facebook and professional networks like LinkedIn, have become an integral part of the hiring process. Human resources managers perform headhunting efforts via social media and professional networks like LinkedIn. Artificial Intelligence (AI) has streamlined the process of talent acquisition for organizations by offering effective and precise platforms that enhance the interaction between job seekers and employers (Rusydan, Ibrahim & Hassan, 2019). In Industry 4.0, the strategic task of Human Resource Management (HRM) is expected to involve the screening process and

decision-making about talent and skills that align with the company's strategy. Additionally, these corporations can significantly reduce recruitment costs by up to 70%. Dennis M (2018) highlights the potential hazards associated with the application of AI in ethical decision-making processes, citing an instance from college recruitment. According to Dennis (2018), while AI has demonstrated reliability in pattern recognition and computation, it cannot replace human beings. Nevertheless, it is possible to contend with the article's claims since artificial intelligence possesses the capability of pattern recognition and can acquire knowledge from cases, enabling it to identify novel patterns more effectively than human beings. One of the notable advantages of AI is its integration with extensive data sets, analytical tools, and machine learning algorithms (Colbert, 2004). These features enable the system to learn from past recruitment experiences, including successful and unsuccessful cases. Artificial intelligence in strategic human resource management should prioritize and draw insights from the HR analytics currently emerging within the HRM sector. According to (Lippens, Schaninger, and Tanner 2019), one of their clients achieved a significant reduction in retention bonuses and unwanted attrition by analysing big data collected from exit interviews and ongoing HR data tracking. The reduction amounted to $20 million. The factors mentioned above highlight the necessity of utilising HR analytics as a continuous process in conjunction with AI-driven strategic human resource management for the fourth industrial revolution. In the Sri Lankan context, it has been observed that companies engaged in developing AI-based strategic HR software, as evidenced by "C-SUITE HR" (2019), have progressed towards utilising HR analytics-based AI solutions for strategic HRM. This is exemplified by the evolution of their career-guiding bot, known as "SIA." The system analyses graduate-level data and, functioning as a career guidance chatbot, presents a career trajectory based on the candidate's skill set. The process of analysis and prediction involves not only considering the candidate's preferences but also analysing the social media context and conducting a series of interviews to gather input. Additionally, the words spoken during the interview are taken into account. The article discusses how HR analytics about an individual's career trajectory is captured and utilized to generate organizational predictions. One of the primary challenges HRM faces in the context of Industry 4.0 pertains to the imperative of cost reduction, coupled with the issue of an ageing workforce that is unlikely to be replenished by younger generations. The reduction of costs is expected to be a significant consideration in the context of Industry 4.0, thereby exerting pressure on manufacturers to ensure the completion of products at the level of detail required (Hecklau et al., 2016). Consequently, Human Resource Management (HRM) must align along with the integration of knowledge, skills from the existing labour force, as well as the implementation of effective training programs. In addition to human resource management, exploring cost-effective solutions that do not entail significant recurring expenses is advisable. Automation is a technological process that enables the replacement of human labour in a specific task. Robotic Process Automation (RPA) is an amalgamation of Information Technology (IT) and Human Resource Management (HRM) that has seamlessly integrated into individuals' daily lives. The integration of artificial intelligence is anticipated to play a crucial role in developing the future workforce within the realm of Robotic Process Automation (RPA), as suggested by (Rai, Siddiqui, Pawar, and Goyal 2019). According to Rai et al. (2019), RPA is a technological innovation that allows organizations to create bots or

robots capable of executing tasks or processes with greater efficiency than humans and without human intervention. Willcocks, Lacity, and Craig (2017) present a case study on implementing robotic process automation (RPA) as a strategic transformation lever for global business services. Specifically, they examine the use of RPA in the step-by-step process automation of Xchanging, an insurance company. From a resource-based perspective, firms should prefer the development and training of their resources to acquire a competitive edge. This involves treating resources as assets that can be leveraged to enhance organizational performance. It is recommended that SHRM explore the possibility of creating training programs, implementing automation for handover and take-over processes, and identifying areas where machines may outperform humans to achieve cost reductions. The research paper titled "Robotic Process Automation - Automating the Automation", authored by Blitz Technologies posits that using RPA necessitates human judgment, as (Rai et al. 2019) stated. The observations mentioned earlier suggest that aligning company strategy with a resource-based view and utilizing AI to enhance the algorithm's capabilities can effectively manage an ageing staff and alleviate cost reduction pressures for a company. Integrating cyber-physical agents can enable the implementation of advanced HR analytics in literature RPA. Over the last decade, there has been a notable shift from an onshore to an offshore workforce, resulting in a significant cost reduction of fourfold. Utilizing RPA technology enables the completion of identical tasks at a cost that is less than half of offshore expenses while maintaining onshore operations. The process of data production involves transferring the output of tasks to the analysis stage to enhance efficiency. This improved data is then reintroduced to the production floors with increased efficiency. Consequently, the utilization of an AI algorithm in the RPA process results in a high level of accuracy due to the absence of human involvement. Consequently, this Robotic Process Automation (RPA) must furnish feedback for the resource plan, which must consistently conform to the corporate and business strategy of the organization, as stated by (Rai et al. 2019). Over the previous decade, there has been a notable shift in the composition of the workforce from onshore to offshore, resulting in a reduction in costs by a factor of four. Implementing Robotic Process Automation (RPA) can reduce costs by more than 50% compared to offshore expenses while ensuring that all tasks are performed domestically. The process of data production involves the transfer of data generated from completed tasks to the analysis phase, where it is analysed to enhance efficiency.

Conclusion

To incorporate an Artificial Intelligence-driven Strategic Human Resource Management system for Industry 4.0, it is imperative to establish an industrial AI framework that can acquire knowledge through a structured learning methodology. As per contemporary AI and machine learning systems, a procedure is required to ascertain the level of expertise and furnish subsequent updates. Thus, the proposed AISHRM system in this paper should be founded on an industrial AI framework. To achieve sustainable competitive advantage and remain competitive in the business world, organizations should prioritize the implementation of AI algorithms. This will not only enhance the skills of individuals but also improve the overall efficiency and effectiveness of the organisation. To effectively incorporate Artificial Intelligence into Strategic Human Resource Management for Industry 4.0, it is imperative to establish an industrial AI framework that can acquire knowledge through a structured learning

methodology. Based on contemporary AI and machine learning methodologies, a systematic approach is required to ascertain the level of expertise and subsequently furnish relevant updates. Thus, the proposed AISHRM system in this paper should be founded on an industrial AI framework. Organisations should prioritise implementing AI algorithms to achieve a competitive edge in the business world and establish a sustainable competitive advantage. These algorithms cannot only enhance individuals' skills but also inform the overall management strategy by drawing insights from past cases. The integration of HR analytics is crucial in the AISHRM framework, spanning the entire employee and organisational life cycle. It is imperative to consider machine learning algorithms and individuals with expertise in advanced AI algorithm development as a means of gaining a competitive edge. The HR analytics component is regarded as the central nervous system of an organisation's entire Artificial Intelligence Strategic Human Resource Management (AI SHRM) system. The system should be able to detect recurring trends that lead to employee resignations and subpar work output. Subsequently, this specific data should be supplied to artificial intelligence algorithms to enhance the precision of predictions for the future. In the context of Industry 4.0, it is imperative to acknowledge machines as resources that necessitate learning, training, handover processes, and analytics, much like human resources. The AISHRM process ought to constitute a comprehensive framework encompassing all HRM facets and extending beyond them. Failure to do so may result in organizations failing to achieve the anticipated return on their investments. The screening and decision-making process for talent selection should probably commence on or before the recruitment phase. The knowledge acquired and resulting output should be archived within a centralized knowledge repository. It is recommended that the results obtained from performance evaluations and other human resources analytics be stored in a centralized repository for comparison with recruitment data. This will facilitate the learning and updating artificial intelligence algorithms for subsequent phases of candidate selection. SHRM must analyse to determine which aspects should be subjected to conversion through RPA and which should not. These decisions must be consistently following the corporate strategy of the organization. The primary objective for the AISHRM process in Industry 4.0 is to commence with the implementation of an automated talent recommendation system. The function mentioned above involves the process of perusing electronic curriculum vitae, extracting relevant data from social media and professional networks, scrutinizing the online conduct of a specific candidate, interfacing with other Human Resource Management systems through Application Programming Interfaces (API), and utilizing automated gaming and psychological tests to conduct a preliminary screening of potential interviewees. The study investigates the correlation between working condition monitoring and its impact on employee motivation and productivity. Specifically, the research seeks to identify the factors that enhance or hinder employee motivation and productivity in the workplace. This module incorporates self-directed learning through online articles and ongoing workplace tasks. Implementing automated tracking systems facilitates the monitoring of performance, efficiency, and work patterns of human and machine entities while also enabling updating knowledge bases. The tracking process will involve the integration of cyber-physical agents. Automated monitoring of performance, efficiency, and work patterns for human and machine entities, with subsequent updates to the knowledge base. The tracking process will involve the integration of cyber-

physical agents. The module is a supplementary component to aid other organisational and operational procedures. Implementing strategic training and development initiatives, which prioritise the monitoring and evaluating of both internal and external resources, can offer guidance on suitable processes for automation through RPA that align with the organisation's overall strategy. This approach also involves training human and machine operators to facilitate specific operations. This module examines patterns of individuals at risk of resigning or experiencing demotivation. It will provide information on the percentage of individuals at risk of leaving, the required replacement level and associated costs. The alignment of these findings with the company's business strategy will also be considered. The module on strategic alignment should truly encompass an evaluation of the comprehensive human resource strategy, corporate and business strategy, and any deviations must be compatible. The transfer of data to the knowledge base is essential for the acquisition of knowledge. The data presented in this module can aid in determining whether the organisation should opt for a novel strategic alternative or establish a durable competitive edge vis-à-vis its competitors in the industry.

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