Comprehensive Framework Integration of AI, Ml, DS into Functional Areas of Human Resource in an Organisation

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Abstract

Artificial Intelligence has revolutionized the ways in which organizations performed and operated, the HRM sector has also been affected by this increased change. Artificial intelligence combined with machine learning has allowed better mobility within the organisation. Within the study, a literature review has been conducted in which several different articles have been observed which have all critically assessed the different aspects of these technologies and how they can be utilized to benefit the organization. AI and ML together can not only predict employee engagement levels but scan through several data sets to identify the candidates that are the most fit for the job. The information that these frameworks provide to organizations, upholds a unique perspective and valuable insight for the HR teams of the organizations. These findings are used to detect signs of burnouts among employees and ways through which their motivation levels can be increased.

Keywords: Human Resource Management, Artificial Intelligence, Machine Learning, Data Science, Recruitment, Employee Engagement and Performance.

1. Introduction

The rise of the digital age has completely transformed how Human Resource Management (HRM) is traditionally performed. The increase in technological advances has been observed in all sectors within the global sphere and has significantly raised the competition level. Due to these factors hiring skilful employees and retaining them has been a significant struggle for many companies. While talent and skill management still are viable necessities for the HRM departments, improving the employee experience through better engagement methods has also been a priority. However, in order to increase job satisfaction levels among employees workplace relationships needs to be improved which is made possible through different frameworks such as Artificial Intelligence (AI), Machine Learning (ML) and Data Science (DS). Votto et al. (2021) have carefully pointed out that integrating technology with HRM practices has improved managerial work within organizations and has effectively reduced the time which was previously taken in handling issues related to employees and their needs.

It has become necessary for the human resource section of the organisation on focusing on the humane aspect within the organisation as these can help with the development of interpersonal relationships among the employees. There are many different applications of

technology within this sector, the rise of Big Data has resulted in organizations having to process and deal with large quantities of results, applicants, and resumes, AI can help in shortlisting the candidates and picking candidates that are the most suitable for the job based on their qualifications. The purpose of the present research is therefore to understand all of the different ways through which HRM practices can be improved. The study has carried out a systematic review of all of the different phenomena to enhance the understanding of the use of artificial intelligence and machine learning in improving both the technical and managerial functions of the organisation.

2. Methodology

The present study essentially deals with understanding how AI and other forms of advanced technologies can be used to improve HRM practices, because of this reason a literature review approach has been utilised which can provide a better insight into these different variables. A literature review allows the researcher to observe and gain inspiration from past research works which has been carried out on the subject. Many researchers have also credited systematic literature review to enhance the quality of the research as it helps in upholding the integrity and transparency of the research (Vrontis et al. 2022). The findings of the past research work and the methods that they have adopted to gain their findings have been analysed successfully by gaining an acute understanding of the themes which the studies have dealt with. The articles used for the present study have carefully been chosen to ensure they meet the standards and focus on the positive attributes that adopting these technological systems can bring to an organisation. It has been identified that AI, machine learning and other forms of advanced technologies are relatively new concepts and often involve complex adoption processes, therefore by researching the importance of them in the field of HRM, confidence level among organizations can be raised to adopt these technologies.

3. Literature Review

According to Budhwar et al. (2022), artificial intelligence and all of the other advanced technologies that are powered through AI-based applications have immense abilities in improving the methods that HRM uses to manage employees within organisations. The different opportunities that organizations gain by adopting AI in their business have been elaborated within the study. The researchers have argued using this technology has improved decision-making practices and used organizational resources more efficiently. AI can human resources with talent acquisition, and the development of employees' skills to retain them. Recruiting employees that fit the business standards and assessing their potential is often a hard procedure, AI can help pick the candidates that are the most suitable for the position. The research has also made use of a systematic literature review for the purpose of the study, the findings of the study show the use of AI for the recruitment process has brought positive moderation effects. The study has also stressed the need of carrying out more research on this topic as it is an emerging concept and not all organizations are ready to accept AI within their organisations yet.

Malik, Thevisuthan & De Sliva (2022) have also carried out research on the use of AI in influencing employee engagement rates and carrying out effective performance reviews. One of the top priorities of the HRM is to raise engagement levels among the employees to increase the profitability aspect of an organisation. The performance of the employees can be

better tracked with the use of AI, their potential and areas which they are lacking can be identified through the use of technology. Demographic differences in the present workforce are also an important factor that organizations need to consider, therefore AI provides different engagement tools to HRM that can be used to manage employees. Employees that feel engaged with the workplace tend to perform better than others, AI can raise their self-esteem, and resilience attempts while simultaneously boosting their optimism levels. Performance management in this regard is significant as it identifies the key performance indicators of the employees and uses them to develop strategies that can help in improving their performance.

Hossin, Ulfy & Karim (2021) have elaborated on the significance of adopting AI and the ways through which it can be utilized to develop the skills of employees and reduce the employee turnover rates within the organisation. In the modern era, most employees seeking better jobs often use different social media platforms such as LinkedIn to seek better employment opportunities, therefore AI can help in recognizing the talent that is fit for the organizations. AI can increase the productivity of the organisation by saving time, money and effort which is used to develop talent. Challenges have been identified in convincing people of the benefits of adopting AI because the fear of job loss and being replaced makes people afraid of changes. AI can however provide training to the individuals on a continuous basis and help them with the adoption of technology.

Berhil, Benlahmar & Labani (2020) have argued that the human capital of an organisation is the most important asset as they help influence the organizational decision-making process to increase the profitability aspect. A survey has been carried out within the study to address the various risks that are associated with human resources. It is part of the HRM's responsibility to help the employees manage their careers and highlight the potential that it creates for the organisation. In order to effectively plan the organizational functions, understanding the skillsets of the employees is important. Increasing motivational levels among the staff and providing adequate training is important to guarantee success. The organizational goals can be set through AI, but the goals need to be attainable to provide employees incentives in reaching them. Artificial intelligence is linked to machine learning as both are based on technology that can attract talent while retaining the existing ones. Performance indicators have been developed to help human resources gain a better perspective on their human capital. The results from this research reveal the employee profiles and their productivity levels.

Gupta (2021) has researched the possibilities of AI and how it can help HRM with virtual assistance. The rise of technology has resulted in the development of tools that can identify the faces of individuals and collect personal information for the development of tools that can help with the manufacturing of the service industries. Similar to call centre agents, virtual assistants can help with the different processes and services that are involved with human resources. HRM members can directly speak to the machines and collect information on the employees within the organisation and use the information to further develop their existing practices. The survey that was carried out within the study has pointed out that 54% of the global companies have incorporated green management practices powered by AI within their organizations, this has dramatically reduced the level of paperwork that was previously

carried out by the organisation. The study is consistent with the other literature observed in this section, as it suggests the use of AI can motivate employees while also creating new environment-friendly opportunities that can greatly impact the organisation.

Rąb-Kettler & Lehnervp (2019) have defined machine learning as a tool that can perform by itself without any form of intervention. Machine learning is empowered through the powers of artificial technology and therefore it can learn from its own mistakes to better perform in the future. Every organisation as pointed out within the thesis uses a certain level of machine learning within their organisation and automation is currently one of the biggest influencers in the field of recruitment. There are several ways machine learning can help with recruitment, job descriptions can be handled through this method, and the CVs of interested candidates can be identified and screened efficiently through this method while also setting up interviews for people. All the recruitment administrative tasks can be efficiently handled with this method, relieving the organisation from the perils and burdens. Recruitment has been described as an industry that experiences high turnover rates and because of this hiring the right candidates is highly important.

In the context of machine learning, Fallucchi et al. (2020) have suggested that machine learning can be utilized to increase engagement levels among employees and also positively impact their performance. The world has become incredibly competitive and therefore to sustain businesses, organizations need to boost the entire firm performance, which can only be conducted by increasing engagement levels and motivating the employees to be more creative. The viability of machine learning in influencing the decision-making procedure of individuals has been the subject of study within the present research. The study has adopted the TDSP framework to observe employee performance levels, the dataset for the study has included 1500 observations, and the findings further confirm the fact that the use of algorithms has shown higher engagement levels among the participants. The importance of incentives in influencing employees cannot be over-emphasized, organisations can increase salary based on their performance and experience as they can significantly outweigh negative emotions and lead them to perform better.

According to Zhang & Qi (2022), employees within an organization are often under a lot of stress which can hamper their performance, due to these reasons better management practices need to be implemented that can help these employees. Deep learning has emerged as an approach that can be used to predict the stress levels of individuals and take necessary actions to improve their job satisfaction rates. Machine learning has various applications, this method has the potential to accurately predict the stress levels of the employees and improve the HRM practices of the organisation in the process. The findings of the study show the capabilities of deep learning and how it is able to predict and assist the performance of employees in real-world scenarios. Within the experiment initially, 500 workers with 14 different attributes were chosen, and the second HAJP dataset which was collected increased the number of participants to 14999. The findings show how this sub-division of machine learning can be used to predict worker behaviours and satisfaction levels within the organisation.

Finally, the research carried out by Tambe, Cappelli & Yakubovich (2019) has shed light on how machine learning can help with workforce optimization. The use of AI in HRM has

become incredibly common over the years, machines can be taught to mimic certain behaviours that they are taught and can even adapt themselves to human behaviour. Because of these reasons, machine learning is now getting used by management to keep better track of employees and their needs. The findings of the study have shown how 22% of the firms have started incorporating machine learning and artificial intelligence within their business procedure. Organizations are able to implement measures that help in determining the organizational goals of the employees and measure the outcomes of their performance. This helps in improving the organizational culture and optimise the employees. Integrating machine learning also has the potential in improving the financial outcomes of the company. The ultimate goal as stated by the researchers is to optimize the business procedure while ensuring the employees are judged based on their performance, machine learning helps in making sure all of the employees are treated fairly within the organization.

As per the study carried out by Dutta (2018), data science can be considered an umbrella term that involves different statistical and mathematical analysis which helps business improves their performances. The HR sector in the modern era is completely data-driven and as a result, data science therefore provides valuable insight into learning and training acquisition. Data science helps in equipping human resources to deal with the recruitment process of the organisation more adequately. Similar to the other studies, the researcher has pointed out the increase in e-recruitment processes that have been going on within the business world and the use of artificial intelligence and machine learning to increase the agility of the recruitment procedure. Using these technologies to streamline the hiring process can have a significant impact on the organisation and reduce costs. Social networking has also increased over the years, and using it to attract new employees has also increased, data science allows organizations to use digital media as their own advantage for recruiting people.

Kimura (2023) has expanded on the idea of using data science in the field of HRM to increase engagement levels among employees. The study suggests that the concept of using data science to predict employee behaviour has been in practice for many years, however, the rise of digitalization has no doubt improved these methods. Research has highlighted that the personal values the employees possess about themselves play a crucial role in dictating their level of satisfaction with the job role. These personal values of the employees have been studied within this section to understand the purpose that they serve in increasing engagement levels. The findings of the study are illuminating as it states that the personal beliefs which are possessed by employees cannot be changed, therefore, organizations needs to assess these personal bias and find ways through which these biases can be turned into strength.

According to Singh & El-Kassar (2019), the use of big data in different industries has continued to transform businesses, however, in order to function effectively it relies on data science and its ability to predict the different supply chain factors. Organizations in recent years have become more environment concerned which has led to the focus on sustainability. In this regard, the researchers have stated that the resources of the firm can be utilized to raise the commitment levels of the employees. The operational strategies of the firm can be improvised to incorporate ways that can increase investment levels and influence decision-making. Data shows that firms often exploit big data for their own personal needs, using it to develop sustainable practices can be beneficial for the organisation in the long run. The

environment-friendly approaches allow organizations to engage with their environment in a better manner and help in creating sustainable values within the organisation.

The final study observed in this study is carried out by Lehrer et al. (2018) and has shed light on how the different analytical tools are being used for analysing the different kinds of data and providing upgraded experience to all of the individuals that are involved with the process. Machine learning and data science can be adopted within organizations to predict employee turnover rates that are to be expected from the business. The different machine-learning processes have been analysed to find ways that can reduce turnover rates and retain employees. The study carried out by Börner et al. (2018) further sheds light on this phenomenon as they have pointed out that in order to increase employee retention, their skills of them need to be sharpened. The workforce needs and educational offerings made by the organisation need to be carefully studied to train them adequately and provide their needs in order to make them stay.

4. Conceptual Framework

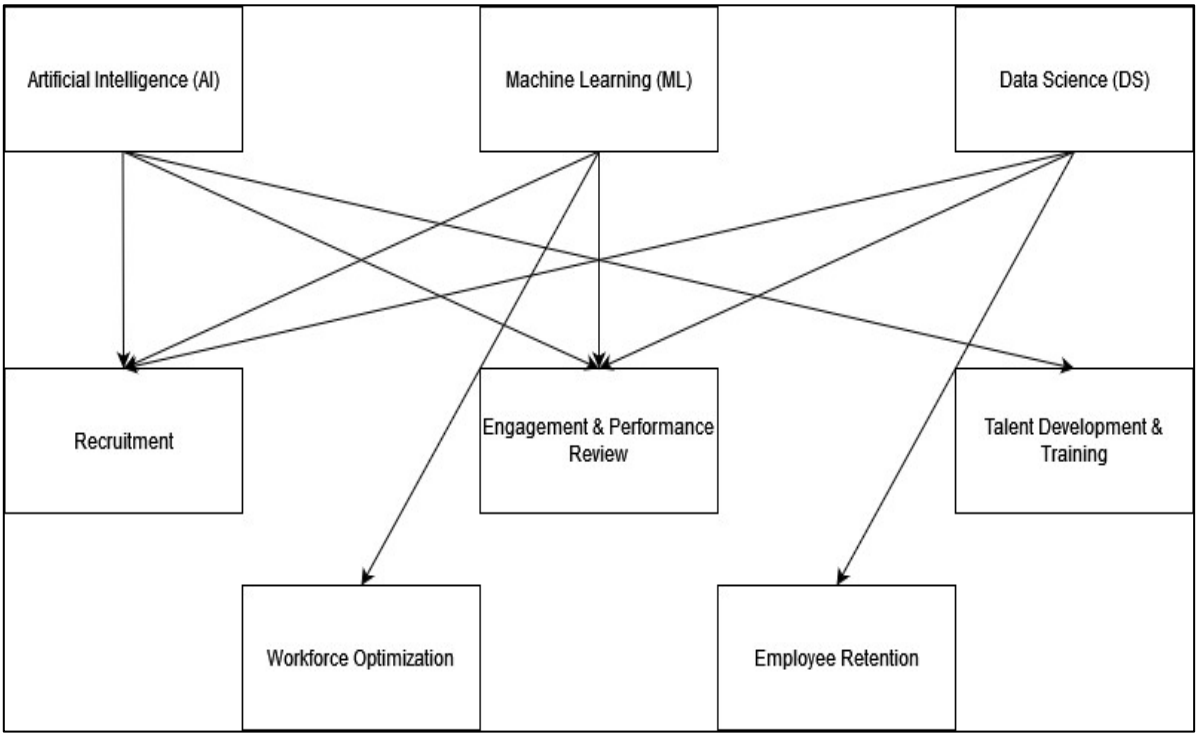

Figure 1: Conceptual Framework
(Source: Self-Developed)

5. Conclusion

As concluding remarks for the present study, it can be seen that the systematic literature review approach which was adopted for the study has successfully shed light on all of the positive impacts artificial intelligence, machine learning and data science have on the HRM and their organizational practices. The study has shown how all of these different frameworks are used collectively to find trends and similarities among the employees and develop engagement, performance and retention protocols that influence the employees and reduces the turnover rates for the organisation. Each of these components has its contributions to increasing the engagement levels of the employees. On the other hand, AI and machine

learning have their significance as they can navigate through different resumes and job applications while picking the ones that are the most suitable for the job position. The study has presented a comprehensive guide on all of the capabilities of these advanced technologies and ways through which they can improve the business procedure.

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