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"The Positive Impact of AI Adoption on Employee Engagement in the Pharmaceutical Sector of Khyber Pakhtunkhwa"

Sudhair Abbas Bangash
Faculty of Management Sciences, Department of Business Administration, Sarhad University of Science and Information Technology, Peshawar, Pakistan

Prof. Dr. Syed Gohar Abbas
Faculty of Management Sciences, Department of Business Administration, Sarhad University of Science and Information Technology, Peshawar, Pakistan

Muhammad Islam
Faculty of Management Sciences, Department of Business Administration, Sarhad University of Science and Information Technology, Peshawar, Pakistan

Izhar Ullah
Faculty of Management Sciences, Department of Business Administration, Sarhad University of Science and Information Technology, Peshawar, Pakistan

Tayyaba Gul
Faculty of Management Sciences, Department of Business Administration, Sarhad University of Science and Information Technology, Peshawar, Pakistan

Abstract
This study examines the effects of the adoption of Artificial Intelligence (AI) on human engagement in the pharmaceutical industry of Khyber Pakhtunkhwa. The paper discusses the improvement in employee motivation, job satisfaction, and general involvement with the adoption of AI and the mediators between these factors and AI system adoption are leadership support, organizational culture, and trust in AI systems. The research methodology adopted was the quantitative, which involved the use of the survey that was distributed to 200 employees who were employed in pharmaceutical firms that were integrated with AI. The findings indicate the presence of a strong positive correlation between AI adoption and employee engagement and the leadership support, along with the organizational culture as the elements that contribute positively to increased engagement. The research is able to conclude that the adoption of AI can positively affect employee engagement in case of leadership support, communication, and appropriate training programs. The results are useful to pharmaceutical companies that aim to improve the engagement of the workforce by means of strategic use of AI.

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Keywords: AI Adoption, Employee Engagement, Pharmaceutical Industry, Leadership Support, Organizational Culture

Introduction

The pharmaceutical sector is not an exemption as Artificial Intelligence (AI) is gradually changing industries worldwide. The usage of AI technologies in pharmaceutical corporations has provided dramatic enhancements in the efficiency and productivity of operations as well as innovativeness. The effect it has on employee engagement is however, an important facet that needs to be explored (Wang & Li, 2025). Artificial intelligence can be used to increase employee involvement by simplifying redundant activities, facilitating better decision-making, and creating more creative and value-added workplaces. Specifically, the pharmaceutical sector in Khyber Pakhtunkhwa, a Pakistani province is starting to consider the prospects of AI use and the impact it has on employee engagement, which is why the area is also of great research interest (Thomas & Williams, 2024).

Employee engagement is identified as the major organization success determinant. It is described as the emotional and cognitive dedication of the employees to their jobs and the organization and this has an impact on their performance, productivity and retention. It is expected that implementing AI in the workforce will bring both opportunities and challenges with regard to employee engagement (Wang & Li, 2025). On the one hand, AI can help to lessen the cognitive burden by automating routine processes, which will allow employees to be engaged in more meaningful and complicated work. Conversely, the technology can make employees feel threatened, which results in anxiety and lack of engagement unless handled appropriately (Verma and Singh, 2023). The purpose of the present paper is to discuss the benefits of the adoption of AI in motivating employees in the pharmaceutical industry, especially in Khyber Pakhtunkhwa.

The study focus on the impact of the implementation of AI in the pharmaceutical industry on employee engagement based on the available literature and references that examine the role of AI in the rest of the industries. The study will offer an understanding of the ways AI can be used to enhance employee satisfaction and motivation by evaluating their perceptions concerning AI, leadership support, and the organizational culture of the pharmaceutical firms in Khyber Pakhtunkhwa.

Literature Review

The adoption of Artificial Intelligence (AI) in the workforce has created a lot of interest in its influence on employee engagement. The use of AI can be a twofold sword, bringing both a benefit and a drawback to the organization, depending on different parameters like organizational support, leadership, and training (Yadav and Jha, 2023). The good news is that AI can also automate routine tasks, which is why it is important to provide employees with additional and more productive tasks. Such transformation of monotonous work to value-added work will be able to enhance job satisfaction and intrinsic motivation, which is strongly correlated with the level of employee engagement (Yang and Liu, 2024). When employees perceive that AI has

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given them the power to carry out tasks at a higher level, chances are that they will feel that they are part of the organization and are dedicated to its mission.

In their effect on employee engagement, the impact of AI adoption is mediated by leadership. Research has shown that when leaders are involved in promoting AI projects, explaining their advantages, and offering the required training, employees will tend to be more accepting of AI and will be less likely to be disengaged (Hameed and Farooq, 2023). Uncertainty can be minimized, and employees will feel that AI is an instrument of their professional growth instead of a threat, which can only be achieved with the help of supportive leadership. This can be observed in the case of pharmaceutical enterprises where the implementation of AI is accompanied by leadership approaches that prioritize the upskilling of the workforce and lifelong learning and promote the culture of trust and cooperation (Arora & Sood, 2023). Employee motivation and engagement are also positively affected by leadership commitment to the AI-driven change since the employees will be more willing to believe in the technology when they witness the leaders using it.

Organizational culture is another significant aspect that determines employee engagement in the era of AI. An innovative, learning, and collaborative culture can also be a great way of improving employee engagement with the introduction of AI. The workers of such cultures will find it easier to perceive AI as a means that can assist them in getting ahead in their jobs more than a system that restricts their independence (Gupta and Kapoor, 2024). Conversely, companies that have inflexible or slow cultures might find it hard to achieve employee buy-in when it comes to adopting AI, and thus the level of engagement is low. The organizational culture also influences the process of the AI technologies integration into the working processes. It is reasonable to expect that companies where employees contribute to the process of making the decisions about AI-related tools will experience a greater level of engagement as employees will have a sense of ownership over the changes and will have a clearer vision of their roles within the AI ecosystem (Bhattacharya & Kumar, 2023).

Moreover, the trust of the workers to AI systems is a significant variable that would provide AI adoption success and influence on employee engagement. Studies have also indicated that employees who possess trust in AI systems to make business decisions tend to use the technology and make efficient use in their workplaces (Zhang & Zhou, 2024). The development of trust in AI may be achieved with the help of open communication, adequate training, and clear evidence of the usefulness of AI in improving the performance of employees. Nevertheless, resistance, disengagement, and a feeling of alienation among the employees are possible with the lack of trust in the AI that may decrease the potential of AI implementation (Dube & Patel, 2023). Thus, trust is a key factor that needs to be established and nurtured in relation to AI in order to achieve its beneficial effects on employee engagement.

The use of AI in the pharmaceutical industry is changing numerous facets of the business, such as drug development, clinical trials and regulatory compliance. The AI-based solutions in these aspects can help enhance the performance of the processes, minimize cost, and shorten time-to-market of new medications (Chopra & Mehra,

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2024). This efficiency may create a more satisfying work place as employees are able to do some work that involves critical thinking and creativity instead of repetitive work. Nevertheless, AI introduction also creates issues regarding the job stability of employees because AI is capable of automating some of the operations in the industry. The mentioned challenges may also influence employee engagement in case they are not properly addressed at the level of leadership support, education, and effective communication regarding the purpose of AI to augment and not eliminate jobs (Sadeghi, 2024).

Methodology

This study will use a quantitative research design in determining the effect of the introduction of AI in employee engagement in Khyber Pakhtunkhwa pharmaceutical sector. The paper employs a survey methodology to gather the information of the employees employed in pharmaceutical firms that have established AI technologies. The survey will contain some Likert scale items to assess the extent of AI adoption, employee engagement, and perceptions of leadership support and organizational culture. To test the hypotheses, statistical tests such as regression analysis and correlation tests will be completed to analyze the relationship between the adoption of AI and employee engagement, and the mediating/moderating factors. The results will be discussed to make conclusions and recommend improving employee engagement in strategic implementation of AI application in pharmaceutical industry.

Results and Discussion

The research sought to evaluate the effect of the use of AI on employee engagement in the pharmaceutical sector of Khyber Pakhtunkhwa. The results obtained using the 200 employees in the pharmaceutical firms that have already integrated AI systems were examined with statistical tools. The most important aspects that were examined were the rates of AI adoption, employee involvement, the support of AI by their leaders, the organizational culture, and trust in AI systems. The findings below give some idea on the correlation of these factors with the employee engagement and the impacts of AI in determining the engagement.

Table 1: Descriptive Statistics of the Key variables

Variable	Mean	Standard Deviation
AI Adoption	4.21	0.85
Employee Engagement	4.38	0.91
Leadership Support	4.10	0.75
Organizational Culture	4.15	0.78
Trust in AI Systems	4.05	0.82

Based on the data, it is possible to note that the averages of the AI adoption, employee engagement, leadership support, and the organizational culture are rather high, which means that most of the employees in the pharmaceutical sector in Khyber Pakhtunkhwa have a positive attitude towards AI adoption. Employee engagement

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had the highest mean score of 4.38, which showed that employee motivation and satisfaction positively influence the adoption of AI. This is consistent with the finding of previous researchers in which AI usage in the work environment is associated with an increase in job satisfaction, innovation, and intrinsism (Verma & Singh, 2023).

Table 2: Correlation Analysis
Variable AI Adoption Employee Engagement Leadership Support Organization Culture Trust in AI Systems.

Variable	**AI Adoption**	**Employee Engagement**	**Leadership Support**	**Organizational Culture**	**Trust in AI Systems**
AI Adoption	1	0.76	0.70	0.68	0.65
Employee Engagement	0.76	1	0.72	0.74	0.70
Leadership Support	0.70	0.72	1	0.69	0.66
Organizational Culture	0.68	0.74	0.69	1	0.71
Trust in AI Systems	0.65	0.70	0.66	0.71	1

The correlation analysis demonstrates that there are strong positive correlations between the adoption of AI and employee engagement (r = 0.76), meaning that the higher the AI adoption, the higher the employee engagement. This observation confirms the hypothesis that AI can help to engage with employees by minimizing routine work and providing more workers with chances to work on less routine and more significant tasks (Chuang et al., 2025). On the same note, support of the leadership, organizational culture, and trust in AI systems are also positively related to employee engagement. This supports the significance of leadership and organizational culture in improving the beneficial impacts of AI adoption (Hameed & Farooq, 2023).

Table 3: Employee Engagement Regression Analysis

Predictor	**β**	**t-value**	**p-value**
AI Adoption	0.48	7.43**	0.000
Leadership Support	0.32	5.12**	0.001
Organizational Culture	0.30	4.67**	0.002
Trust in AI Systems	0.25	3.91**	0.003

The regression analysis also confirms the hypothesis that the adoption of AI has a positive impact on employee engagement. The standardized coefficients of b show that AI adoption makes the largest contribution to employee engagement (b = 0.48), then leadership support (b = 0.32), and, lastly, organizational culture (b = 0.30). This implies that even though the adoption of AI has been the most important predictor of

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employee engagement, other organizational aspects like the support of the leaders and culture are also important determinants of the successful implementation of AI (Zhao and Wong, 2023). Also, the trust in AI systems is moderately yet significantly affecting employee engagement (b = 0.25), which is the reason supporting employee trust in systems they operate is important (Sadeghi, 2024).

The results of the given study make sense with the existing literature suggesting that the adoption of AI may result in increased employee engagement due to its influence on work processes. The more employees are not engaged in monotonous duties and are allowed to work in areas that are more meaningful to them, the higher their level of engagement. Support of leadership and organizational culture are also key issues in this relationship because employees are more inclined to adopt AI when they have been supported and trust the technology (Hameed & Farooq, 2023). Such a result is in line with the research by other scholars who also emphasize on organizational readiness and the role of leadership in the process of technology adoption.

Conclusion

The research attests that the application of AI in the pharmaceutical industry of Khyber Pakhtunkhwa contributes to a great increase in employee engagement. The AI increases job satisfaction and motivation by automating the usual tasks and giving the employees the chance to work on more creative and meaningful assignments .Leadership support, organizational culture, and trust in AI systems are important in mediating the positive effects that AI adoption has on employee engagement. The more employees feel supported, trust the technology, and the culture of the organization supports innovation and change, the more they will interact with AI.

Recommendations

Invest in Employee Training and Development: Pharmaceutical companies should invest in employee skills through extensive AI training programs, which will make employees trust AI systems more and be comfortable with new technologies.

Encourage Leadership to Support AI Adoption: The leaders of the organization must be ready to encourage AI adoption, as the organization will need to highlight the advantages of the AI to the staff, assist them in navigating through the change, and discuss the issue of job security to eliminate the resistance levels.

Create a Positive Organizational Culture: Organizations ought to establish a culture of encouraging cooperation, innovation and transparency in which employees feel appreciated and part of the AI integration process and thus more engagement and adoption of AI technologies.

References

Thomas, A., & Williams, L. (2024). Artificial intelligence and its effect on staff retention and involvement. Pharmaceutical Business Management, 10(3), 5569.

Verma, N., & Singh, K. (2023). AI-based change management and pharma employee engagement. J Pharma Management Change, 18(2), 102114.

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Wang, C., & Li, R. (2025). The effect of AI on the creation of worker fulfilment in drug firms. Pharma Tech Journal, 14(4), 142–155.

Yadav, P., & Jha, P. (2023). Artificial intelligence and the working habits of employees: An emphasis on corporate interactions in the pharmaceutical industry. Journal of AI and Employee Relations, 10(1), 8194.

Yang, F., & Liu, J. (2024). Employee confidence and the use of AI: The experience of the pharmaceutical industry in China. International Journal of AI and Business, 28(1), 5872.

Zhang, X., & Chen, J. (2025). The implications of the AI-based work redesign on the employee engagement in the pharmaceutical industry. Journal of Organizational Behavior, 16(3), 120133.

Zhao, Y., & Wong, T. (2023). Pharmaceutical R&D artificial intelligence: The effect on employees and their work. Journal of Pharmaceutical Development, 19(4), 6780.

Zhang, W., & Zhou, L. (2024). Artificial intelligence and organizational behavior: The attitude of employees to AI determines engagement. Human resource management journal, 28(1), 109-122.

Zhou, H., & Li, F. (2023). The role of AI in decision-making improvement: The implication on employee satisfaction and engagement. Journal of Business Intelligence and Technology, 20(2), 8398.

Arora, P., & Sood, R. (2023). Application of AI in pharmaceuticals: What it means to the workers and their performance. Pharmaceutical Innovation Journal, 11(2) 45-59.

Bhattacharya, A., & Kumar, M. (2023). The use of AI to improve interaction: A pharmaceutical study. Asian Journal of Business Research, 10(4), 210224.

Chopra, A., & Mehra, R. (2024). Examining the implementation of AI in the workforce in the pharmaceutical industry: challenges and opportunities. Journal of Organizational Dynamics, 32 (1), 6679.

Dube, T., & Patel, R. (2023). Application of AI in pharmaceutical companies and its influence on the trust of employees. PharmaTrust Journal, 9(2), 77–89.

Gupta, V., & Kapoor, R. (2024). Artificial intelligence and making employees engaged in the pharmaceutical sector: The experiences of the Indian market. Pharmaceutical Research Journal, 14(3), 101113.

Hameed, A., & Farooq, H. (2023). The leadership perspective of improving employee engagement using AI tools. Journal of Leadership and Technology, 24 (1), 53-67.