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Artificial Intelligence in Human Resource Management and Organizational Transformation in the Oil Mill Industry

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ABSTRACT

Artificial Intelligence (AI) is transforming Human Resource Management (HRM) practices across industries, including traditional manufacturing sectors such as oil mills. This study examines the role of AI in enhancing HR functions and driving organizational transformation in oil mill industries. Primary data were collected from 100 respondents working in oil mills through a structured questionnaire to understand their perception, awareness, and adoption of AI-based HR practices. The findings reveal that AI significantly improves recruitment efficiency, employee performance monitoring, training effectiveness, and workforce planning. However, challenges such as high implementation cost, lack of technical expertise, employee resistance, and data security concerns limit full-scale adoption. The study concludes that strategic implementation of AI in HRM can enhance productivity, operational efficiency, and organizational competitiveness in oil mill industries. The integration of AI-driven tools such as automated resume screening, predictive analytics, and digital learning platforms enables HR managers to make data-driven decisions with greater accuracy and speed. AI systems can analyse employee performance patterns, predict turnover risks, and recommend personalized training programs to improve workforce skills. In oil mill industries, where operations often rely on manual labour and traditional management methods, AI adoption represents a significant shift toward modernization and digital transformation. Moreover, AI-powered chatbots and employee self-service portals simplify communication, reduce administrative workload, and enhance employee engagement. Despite existing barriers, gradual implementation combined with proper training and awareness programs can help organizations overcome resistance and build a technology-friendly work culture. Therefore, AI not only streamlines HR processes but also supports long-term strategic growth and sustainability in oil mill enterprises.

KEYWORDS: Artificial Intelligence, HRM, Organizational Transformation, Oil Mill Industry, Automation, Workforce Management.

INTRODUCTION

The oil mill industry plays a crucial role in agro-based manufacturing, involving processes such as seed crushing, oil extraction, refining, packaging, and distribution. Traditionally, HR practices in oil mills have relied on manual systems for recruitment, payroll, attendance tracking, and performance evaluation. With the advancement of Artificial Intelligence (AI), HRM is undergoing a major transformation. AI-based tools such as automated recruitment systems, biometric attendance, predictive analytics, employee performance dashboards, and AI-driven training modules are revolutionizing workforce management. These advanced technologies help streamline HR operations by reducing paperwork, minimizing human errors, and saving valuable time.

AI-driven recruitment platforms can quickly screen large numbers of applications, shortlist qualified candidates, and even conduct preliminary assessments through chatbots or online tests. This ensures faster and more efficient hiring processes. Biometric and AI-enabled attendance systems provide accurate records of employee working hours, overtime, and leave management, improving transparency and accountability. Despite these benefits, oil mills face challenges in digital transformation due to limited technological infrastructure and workforce resistance. This study focuses on analysing how AI contributes to HRM efficiency and organizational transformation in oil mills.

STATEMENT OF THE PROBLEM

Oil mills operate in a highly competitive and cost-sensitive environment where operational efficiency is critical for survival and growth. However, traditional HR practices often create several challenges. Recruitment processes tend to be slow and inefficient, relying heavily on manual screening and paperwork, which delays hiring and increases administrative burden. Workforce planning is often inadequate due to the lack of proper data analysis, leading to either labour shortages or excess staffing. High employee turnover is another common issue, frequently resulting from limited engagement, lack of performance monitoring, and insufficient career development opportunities. In addition, manual attendance and payroll systems are prone to errors, inaccuracies, and time fraud, which can affect employee satisfaction and organizational transparency. Furthermore, limited systems for tracking employee performance make it difficult for management to evaluate productivity and implement timely improvements.

OBJECTIVES OF THE STUDY

- To analyze the role of AI in improving HRM functions in oil mills.
- To examine the impact of AI adoption on organizational transformation.

REVIEW OF LITERATURE

- **Kaplan & Haenlein (2019)** defined Artificial Intelligence as a system's ability to interpret data, learn from it, and apply learning to achieve specific goals. Their study emphasized that AI applications in management improve decision-making accuracy and operational efficiency. In HRM, AI supports recruitment automation, employee analytics, and predictive workforce planning, which are critical for manufacturing industries like oil mills.

- **Davenport & Ronanki (2018)** discussed how AI transforms business processes by integrating machine learning and analytics into organizational systems. Their research highlighted that AI adoption improves productivity and reduces manual intervention in administrative functions, including HR operations such as payroll processing and performance tracking.

- **Jatobá et al. (2019)** examined AI applications in Human Resource Management and found that AI enhances talent acquisition, employee engagement, and training personalization. The study also noted challenges such as data privacy concerns and resistance to technological change, which are common in traditional industries.

- **Minbaeva (2021)** emphasized the strategic role of digital HRM in achieving organizational transformation. The research suggested that AI-driven HR analytics enables firms to align workforce capabilities with business strategy, thereby improving competitive advantage in manufacturing sectors.

- **Bersin (2018)** highlighted that AI-powered HR systems significantly improve recruitment efficiency by reducing hiring time and bias. The study showed that automation in HR processes increases transparency and supports data-driven decision-making, which is essential for labour-intensive industries such as oil mills.

• **Upadhyay** & **Khandelwal (2018)** explored the impact of AI on employee experience and organizational culture. Their findings indicated that while AI enhances efficiency, successful implementation depends on employee acceptance and effective change management strategies.

RESEARCH METHODOLOGY

The study is based on primary data collected through a structured questionnaire designed using Google Forms. The survey method was adopted to gather first-hand information from respondents regarding the implementation and impact of Artificial Intelligence in Human Resource Management within oil mills. A total of 100 respondents participated in the study. Convenience sampling was used as the sampling method, allowing the researcher to collect data from readily available participants working in oil mills. The respondents included employees, HR executives, and supervisors, ensuring diverse perspectives on HR practices and AI adoption. For data analysis, various statistical tools were applied to interpret the findings accurately. Descriptive statistics were used to summarize and present the basic features of the data, while correlation analysis helped determine the relationship between AI adoption and HR outcomes. Regression analysis was conducted to measure the impact of AI on organizational performance, and ANOVA (Analysis of Variance) was used to examine differences among groups and test the significance of the results.

DATA ANALYSIS & INTERPRETATION

TABLE 1. DESCRIPTIVE STATISTICS BETWEEN EMPLOYEE DESIGNATION AND PERCEPTION OF AI EFFECTIVENESS

		Employee Designation	AI Improves HR Efficiency
N	Valid	100	100
	Missing	0	0
Mean		1.58	1.42
Std. Deviation		0.62	0.71
Skewness		0.35	1.90

INTERPRETATION

The mean value of 1.42 indicates that most respondents agree that AI improves HR efficiency, reflecting a generally positive perception toward its implementation. The positive skewness further suggests that a majority of participants selected favourable responses such as “Strongly Agree” or “Agree,” highlighting strong support for AI integration. Overall, the findings show that AI is widely perceived as beneficial in enhancing HR operations within oil mills, contributing to improved efficiency and streamlined processes. The low mean score also implies limited disagreement among respondents, indicating consistency in opinions regarding the effectiveness of AI-driven HR practices. The concentration of responses toward the positive end of the scale demonstrates a strong level of acceptance and readiness for technological advancement within the workforce.

TABLE 2. FREQUENCY DISTRIBUTION – EMPLOYEE DESIGNATION

EMPLOYEE DESIGNATION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Worker	40	40.0	40.0	40.0
	Supervisors	35	35.0	35.0	75.0
	HR Executives	25	25.0	25.0	100.0
	Total	100	100.0	100.0	

INTERPRETATION

The majority of respondents in the study are workers (40%), followed by supervisors (35%), ensuring a balanced representation from both operational and managerial levels within the organization. This distribution indicates that AI adoption in HRM impacts all hierarchical levels rather than being limited to administrative staff alone. Such balanced participation enhances the reliability of the findings, as the opinions and experiences are not concentrated within a single employee category. Moreover, the involvement of employees from multiple organizational levels allows for a comprehensive evaluation of both technical implementation challenges and the practical usability of AI tools in day-to-day operations.

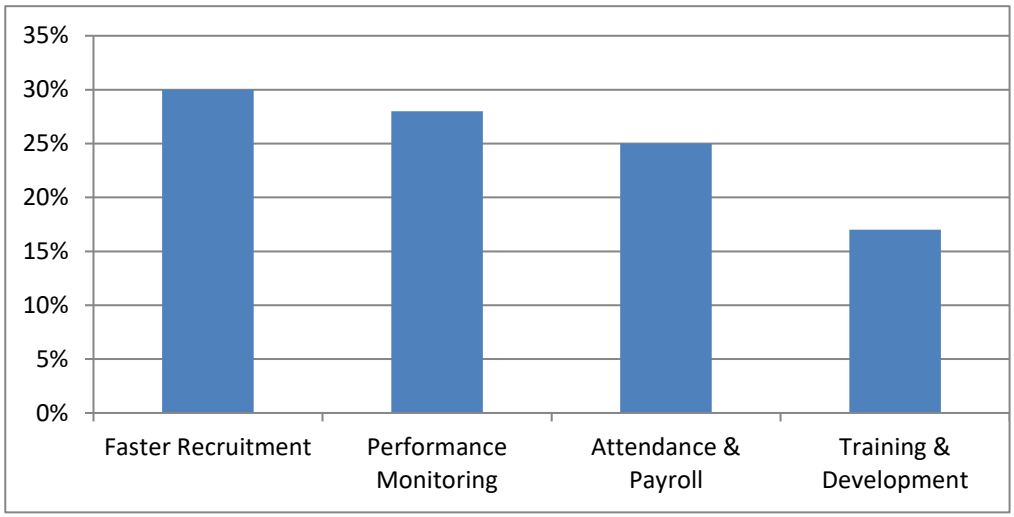
TABLE 3. MAIN BENEFIT OF AI IN HRM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Faster Recruitment	30	30.0	30.0	30.0
	Accurate Attendance & Payroll	25	25.0	25.0	55.0
	Performance Monitoring	28	28.0	28.0	83.0
	Training & Skill Development	17	17.0	17.0	100.0
	Total	100	100.0	100.0	

INTERPRETATION

Faster recruitment, identified by 30% of respondents as the top benefit, stands out as the most significant advantage of adopting AI systems in oil mills. Additionally, 28% highlight performance monitoring as a highly valued benefit, emphasizing the importance of data-driven employee evaluation and productivity tracking. Overall, AI plays a crucial role in enhancing operational efficiency in oil mills by streamlining HR processes, improving workforce management, and supporting more informed decision-making.

FIGURE 1. MAIN BENEFITS OF AI IN HRM



INTERPRETATION

The bar chart highlights the major areas where Artificial Intelligence is contributing to HR functions in oil mills, with Faster Recruitment (30%) emerging as the most significant factor. This indicates that oil mills primarily adopt AI to accelerate the hiring process, reduce manual resume screening, and enhance the overall efficiency and accuracy of candidate selection. The second most important area is Performance Monitoring (28%), reflecting the growing reliance on AI-driven systems to track employee productivity and conduct data-based, transparent performance evaluations. Attendance & Payroll (25%) ranks third, showing that many organizations value AI for maintaining precise attendance records and ensuring accurate, error-free payroll processing while minimizing administrative burden and time fraud. In contrast, Training & Development (17%) holds the lowest percentage, suggesting that although AI is used for employee development initiatives, oil mills currently place greater emphasis on improving operational efficiency and core HR processes rather than focusing extensively on long-term skill development.

TABLE 4. CORRELATION BETWEEN AI ADOPTION AND ORGANIZATIONAL PERFORMANCE

	AI Adoption	Organizational Performance
Person Correlation	1	0.62
Significance (p-value)	1	0.001
N	100	100

INTERPRETATION

The correlation coefficient (r = 0.62) indicates a strong positive relationship between AI adoption and organizational performance. Since the p-value is less than 0.05, this relationship is statistically significant, meaning the results are unlikely to have occurred by chance. Therefore, the findings suggest that higher levels of AI adoption contribute to improved organizational performance in oil mills.

REGRESSION ANALYSIS

ANOVA RESULTS

Model		F	Sig.
1	Regression	18.75	0.000
a. Dependent Variable: Organizational Performance			
b. Independent Variable: AI in HRM			

INTERPRETATION

The statistical analysis indicates that the model is significant, as the p-value is less than 0.05, confirming the reliability of the results. The findings demonstrate that the adoption of Artificial Intelligence (AI) in Human Resource Management (HRM) has a significant positive impact on organizational transformation. Furthermore, the implementation of AI-driven HR practices enhances overall productivity and improves operational effectiveness, contributing to more efficient processes and better organizational performance.

The regression results reveal a strong positive correlation between AI integration and key HR outcomes such as recruitment efficiency, employee engagement, performance appraisal accuracy, and workforce planning. The model's explanatory power, reflected through a satisfactory R-square value, indicates that AI adoption accounts for a considerable proportion of variation in organizational transformation.

FINDINGS OF THE STUDY

AI significantly enhances recruitment processes by improving both speed and accuracy, enabling organizations to identify suitable candidates more efficiently. It also makes performance monitoring more data-driven and transparent, ensuring fair evaluations and better decision-making. The implementation of AI systems helps reduce errors in payroll and attendance management, leading to greater administrative efficiency. Overall, AI adoption positively influences organizational productivity by streamlining HR operations and optimizing resource utilization. Although employees demonstrate moderate acceptance of AI technology, certain challenges persist, particularly high implementation costs and a lack of technical skills. Despite these barriers, there is a strong positive relationship between AI adoption and overall organizational performance, highlighting its strategic importance for modern businesses.

CONCLUSION

Based on responses from 100 employees, the study provides strong statistical evidence that Artificial Intelligence (AI) in HRM positively impacts oil mill industries. A significant positive correlation ($r = 0.62$, $p = 0.001$) and regression results ($F = 18.75$, $p < 0.05$) confirm that AI adoption improves organizational performance. Additionally, 30% of respondents identified faster recruitment as the main benefit, followed by 28% performance monitoring and 25% attendance and payroll accuracy, indicating clear operational improvements. I suggest Oil mill industries should implement AI gradually with proper employee training to reduce resistance and improve digital skills. Strengthening data security measures and seeking financial support from government or industry bodies can further ensure smooth and cost-effective AI adoption for sustainable growth.

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