

A STUDY OF THE IMPACT OF AI ON HUMAN RESOURCES MANAGEMENT PRACTICES A STUDY IN SELECT STEEL MANUFACTURING UNITS OF CHHATTISGARH

Authors

Amisha Patel, Sumita Dave

ABSTRACT

This study explores the impact of Artificial Intelligence (AI) on Human Resource Management (HRM) in selected steel industries of Chhattisgarh. It examines how AI affects core HR functions like recruitment, performance management, training, and employee engagement. Using a mixed-method approach, the research highlights AI's benefits in improving efficiency and decision-making while addressing challenges such as job displacement and data privacy. The study offers recommendations for ethical and effective AI integration in HRM. It focuses on how AI affects key HR functions like recruitment, performance management, training, employee engagement, and workforce planning. Using surveys and interviews, the study analyzes the level of AI adoption, its benefits (such as improved efficiency and reduced hiring bias), and challenges (like job loss fears and data privacy issues). The findings offer insights and recommendations for balancing AI technology with human-centric HR strategies for ethical and effective workforce management

Keywords: Artificial Intelligence, Human Resource Management, Steel Industry, Chhattisgarh, Recruitment, Employee Engagement, Workforce Planning

INTRODUCTION

The introduction highlights how Artificial Intelligence (AI) is transforming Human Resource Management (HRM), especially in steel industries where efficient workforce management is essential. In Chhattisgarh—a major hub for steel production—AI is being increasingly adopted to address workforce challenges such as high attrition, skill shortages, and safety concerns.

AI technologies are reshaping key HR functions:

- **Recruitment** through automated resume screening, chatbots, and predictive analytics;
- **Onboarding** with virtual assistants and document automation;
- **Training** via personalized learning and analytics;
- **Performance Management** using real-time feedback and data-driven evaluations;
- **Employee Engagement** through sentiment analysis and surveys;
- **Workforce Planning** with predictive analytics and strategic modeling;
- **Payroll and Compliance** by reducing errors, personalizing benefits, and automating audits.

The study also considers the perceptions of HR professionals and employees on these AI-driven processes, focusing on their benefits and challenges.

Objectives of the Study:

1. To analyze how AI is transforming HR functions like recruitment, engagement, and performance management in Chhattisgarh's steel industry.
2. To evaluate AI's impact on workforce efficiency and decision-making using automation and data analytics.
3. To identify challenges and opportunities in adopting AI for HR, including barriers and future trends.

LITERATURE REVIEW

- **Khatari et al. (2020)** emphasized the need to integrate AI into HR practices by balancing both technological and human resources. Their qualitative review developed two models linking AI and HRM, highlighting the importance of upskilling, performance automation, and employee morale. The study concluded that technology and people must work together for organizational growth.
- **Johansson and Herranen (2019)** highlighted that AI's role in recruitment is emerging, with limited full-scale implementation. The main benefits are enhanced speed and efficiency, while the primary challenge is organizational readiness for technological change.
- **Barbara van Pay (2018)** noted that AI streamlines recruitment by reducing time-to-hire through tools like AI screening and interviewing platforms (e.g., HireVue, Mya), enabling faster and more accurate candidate selection.
- **Albert Christopher (2019)** pointed out that AI boosts employee productivity and decision-making by analyzing and predicting outcomes. However, issues like data privacy, bias, and system reliability need to be addressed with caution.
- **Yawalkar (2019)** supported this by showing that AI reduces workload and improves efficiency, though organizations must overcome integration challenges.
- **Jauhari (2017)** explored how AI and machine learning automate recruitment tasks using chatbots and email responses. A Deloitte report cited in the study found that while over half of companies are ready to deploy digital HR tools, fewer have fully implemented them.
- **Vatsa and Gullamjji (2019)** reinforced that AI improves performance in all HR areas—recruitment, onboarding, training, retention—but cost remains a barrier to full integration.
- **Bhardwaj et al. (2020)** conducted an empirical study on IT professionals, showing a strong correlation between AI usability and innovation in HR functions. Their regression analysis confirmed that AI enhances HR effectiveness and supports Industry 4.0 transformations.

RESEARCH METHODOLOGY

Research Plan

- **Research Method Used:** Both **Quantitative** and **Qualitative** methods were used to obtain a comprehensive understanding of the research topic.
- **Research Design:** **Descriptive Research Design** was employed.

Research Design Overview:

- **Descriptive Research Design:** Used to systematically observe and describe the characteristics of the target population without manipulating the environment. It answers questions like *what, where, when, and how*.
- **Exploratory Research Design (Brief Note):** Also referenced, this design is typically used in early stages of research when problems are not well-defined. It helps gather preliminary insights through literature reviews, interviews, and focus groups.

Sampling Plan

- **Sampling Method: Non-probability sampling** was chosen due to its convenience and accessibility.
- **Sampling Technique: Convenience Sampling** – respondents were selected based on availability and willingness to participate.
- **Sample Size: 50 respondents** were chosen from various HR sectors and employee groups to ensure diversity.

Data Collection Tools

- **Instrument:** Structured **questionnaire**
- **Source of Data:** Employees and professionals across different sectors of HR

This methodology enabled the collection of both qualitative insights and quantitative data, offering a balanced view for analysis and conclusions in the study.

DATA ANALYSIS AND INTERPRETATIONS

1.Years of Experience in the Steel Industry:

Variables	Respondents	Percentage
○ Less than 1 year	25	50%
○ 1-5 years	5	10%
○ 6-10 years	12	24%
○ More than 10 years	8	16%

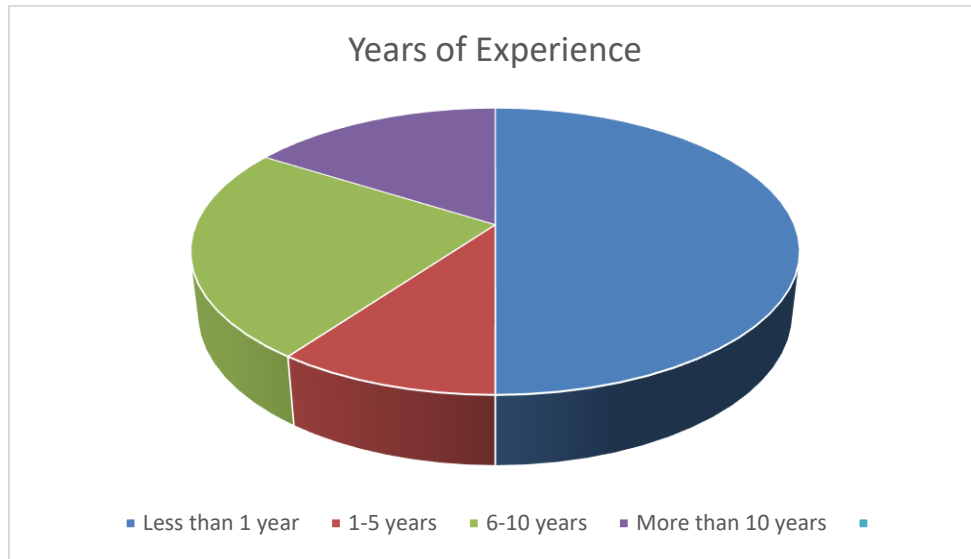


Figure no. 5.1: From the above graph we observe that 50% of the respondents are been experienced with Less than 1 years, 10% of the respondents are been experienced with 1-5 years, 24% of the respondents are been experienced with 6-10 years and 16% of the respondents are been experienced with more than 10 years.

2. Are you aware of the use of AI in Human Resource Management (HRM)?

Variables	Respondents	Percentage
○ Yes	45	90%
○ No	5	10%

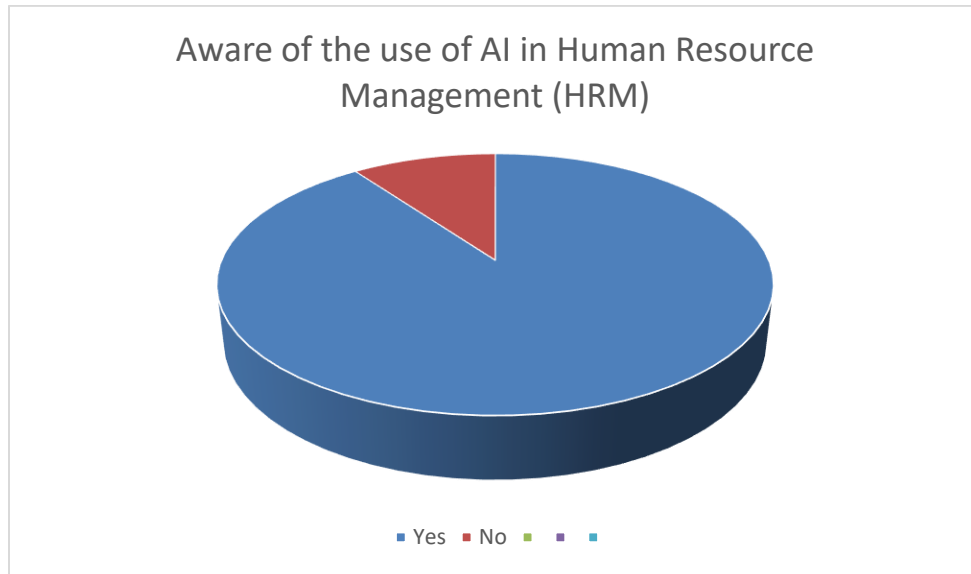


Figure no. 5.2: From the above graph we observe that 90% of the respondents are been aware of the use of AI in Human Resource Management (HRM) and 10% of the respondents are not been aware.

3. Which HR functions in your company use AI?

Variables	Respondents	percentage
○ Recruitment & Selection	20	40%
○ Employee Onboarding	12	24%
○ Performance Management	6	12%
○ Training & Development	4	8%
○ Payroll & Benefits Management	7	14%
○ Employee Engagement & Retention	1	2%

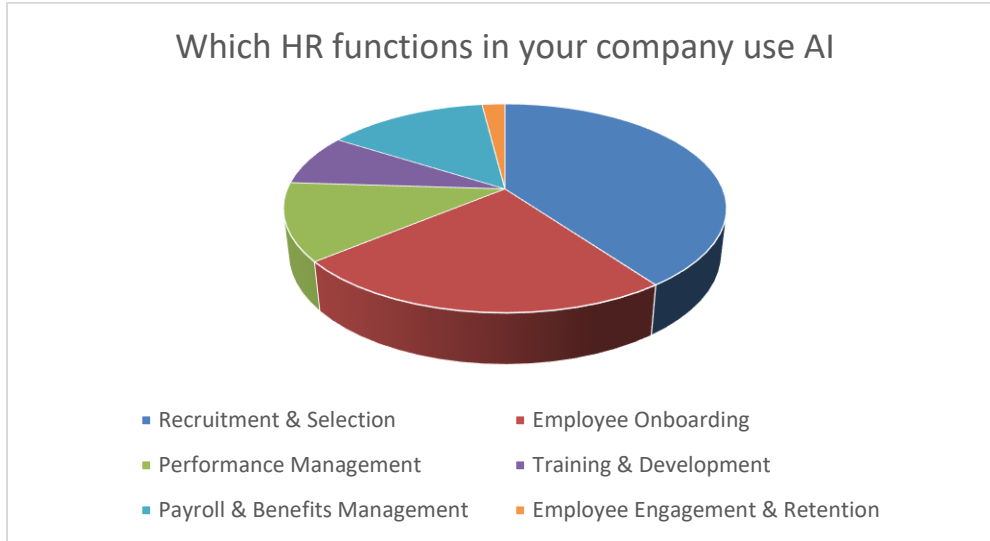


Figure no. 5.3: From the above graph we observe that 40% of the respondents are been aware of the HR functions in our company use AI as recruitment & selection ,24% employee onboarding use AI and 12% company uise AI as performance management and training and development as 8%and payroll& benefits managent 14% and Employee Engagement & Retention as 2%.

4. To what extent has AI improved efficiency in HR functions?

Variables	Respondents	Percentage
○ Very High	14	28%
○ High	12	24%
○ Moderate	6	12%
○ Low	8	16%
○ No Improvement	10	20%

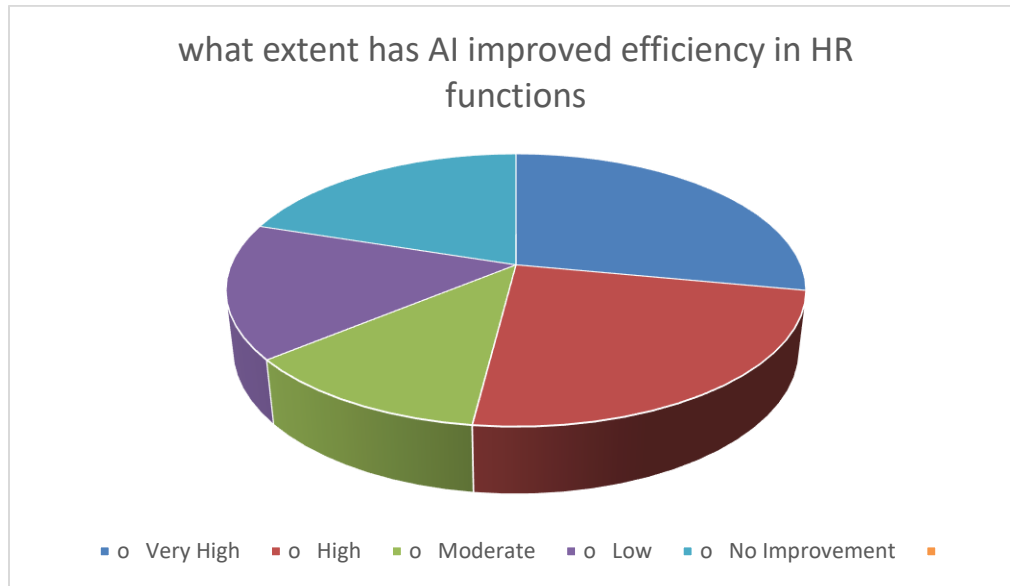


Figure no. 5.4: From the above graph we observe that respondents are been AI improved efficiency in HR functions 28% very high, 24% high, 12% moderate, 16% low and 20% with no improvement.

5. Has AI improved the recruitment and selection process in your organization?

Variables	Respondents	percentage
○ Yes, significantly	24	48%
○ Yes, to some extent	12	24%
○ No significant change	6	12%
○ Not at all	8	16%

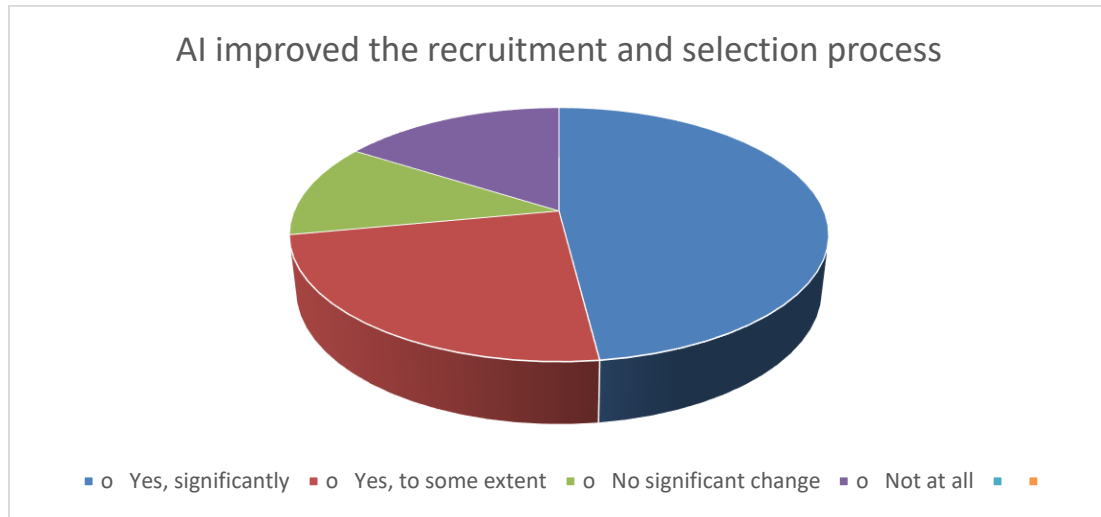


Figure no. 5.5: From the above graph we observe that AI has improved the recruitment and selection process in your organization 48% with Yes, significantly, 24% with Yes, to some extent, 12% with No significant change and 16% with Not at all.

6. Has AI helped in reducing biases in recruitment and selection?

Variables	Respondents	Percentage
o Strongly Agree	40	80%
o Agree	2	4%
o Neutral	6	12%
o Disagree	1	2%
o Strongly Disagree	1	2%

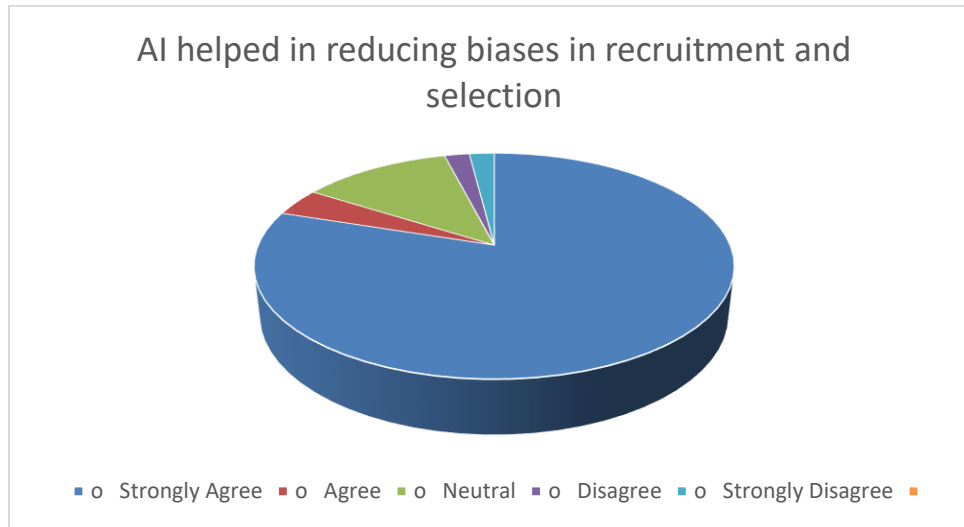


Figure no. 5.6: From the above graph we observe that AI helped in reducing biases in recruitment and selection 80% are Strongly Agree, 4% Agree, 12% neutral, 2% Disagree and 2% Strongly Disagree.

7. What challenges do you face in AI adoption in HRM?

Variables	Respondents	Percentage
○ High implementation cost	6	12%
○ Lack of technical expertise	12	24%
○ Employee resistance to AI	16	32%
○ Data privacy concerns	5	10%
○ Lack of clarity in AI outcomes	11	22%

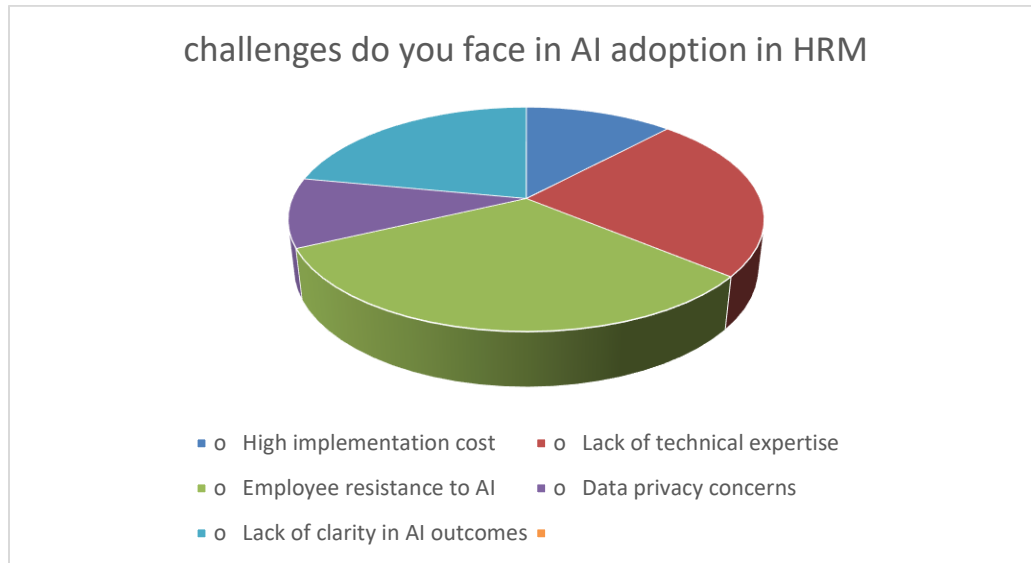


Figure no. 5.7: From the above graph we observe that challenges face in AI adoption in HRM High implementation cost 12%, Lack of technical expertise 24%, Employee resistance to AI 32%, Data privacy concerns 10%, Lack of clarity in AI outcomes 22%.

8. Do you believe AI will replace human HR professionals in the future?

Variables	Respondents	Percentage
o Yes	36	72%
o No	12	24%
o Not sure	2	4%

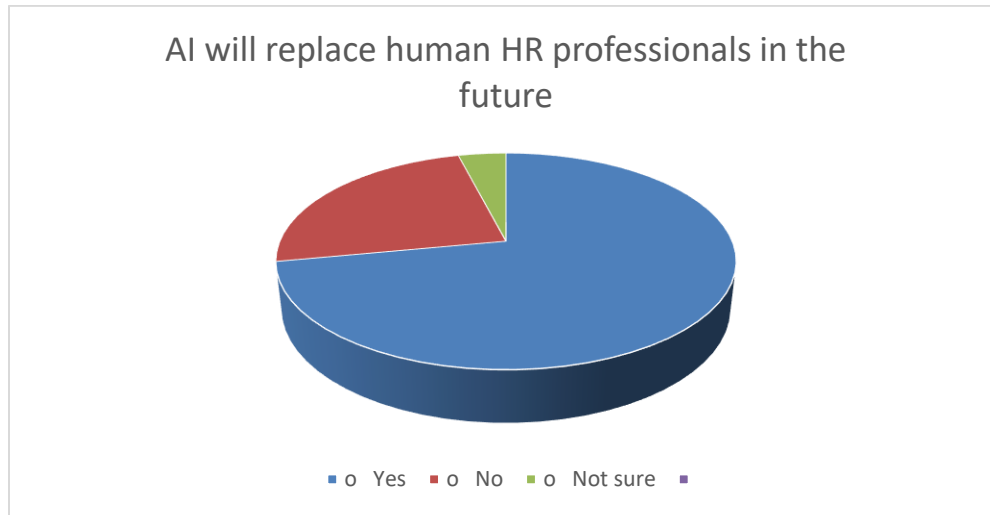


Figure no. 5.8: From the above graph we observe that AI will replace human HR professionals in the future 72% respondents with yes, 24% with no, 4% with not sure.

9. What measures can improve AI adoption in HRM? (Multiple choices allowed)

Variables	Respondents	Percentage
○ Proper training programs	16	32%
○ More transparent AI systems	17	34%
○ Cost-effective AI solutions	7	14%
○ Better regulatory framework	10	20%

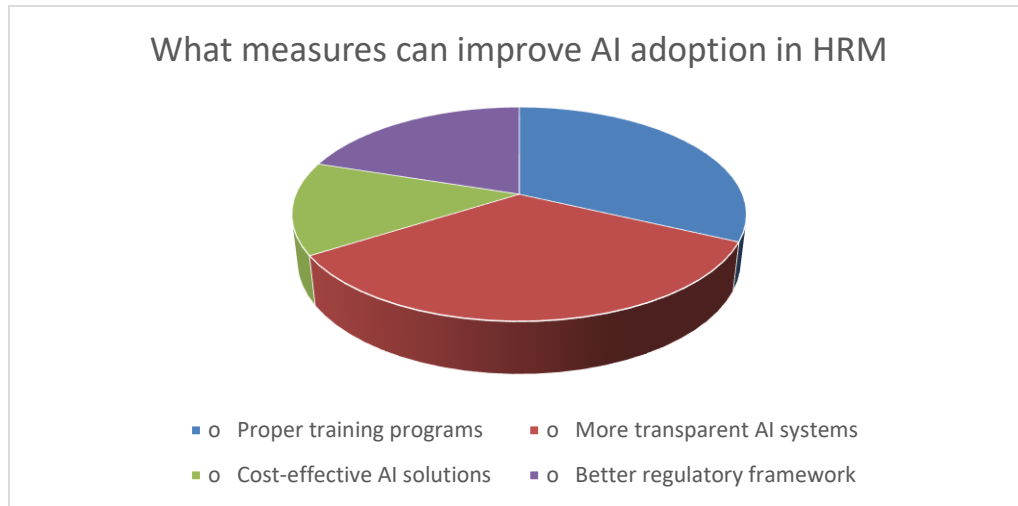


Figure no. 5.9: From the above graph we observe that measures can improve AI adoption in HRM 32% with Proper training programs, 34% with More transparent AI systems, 14% with Cost-effective AI solutions and 20% with Better regulatory framework.

10. How frequently is AI-based technology used in your HR processes?

Variables	Respondents	Percentage
○ Very Frequently	38	76%
○ Frequently	7	14%
○ Occasionally	2	4%
○ Rarely	1	2%
○ Never	2	4%

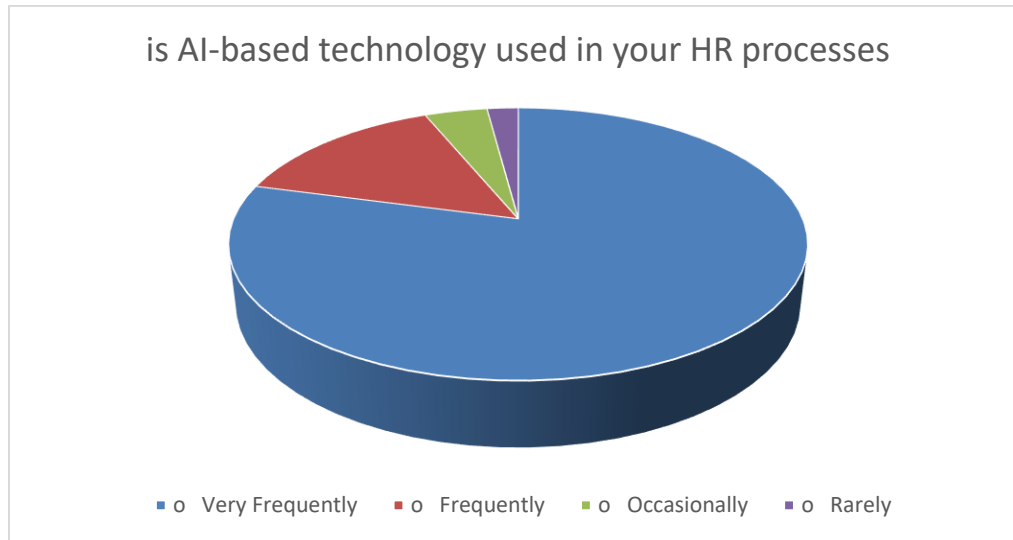


Figure no. 5.10: From the above graph we observe that AI-based technology used in your HR processes 76% is Very Frequently, 14% frequently, 4% occasionally, 2% rarely and 4% never.

11. AI has made the recruitment process in your organization:

Variables	Respondents	Percentage
o Much faster	35	70%
o Slightly faster	7	14%
o No change	7	14%
o Slower	1	2%

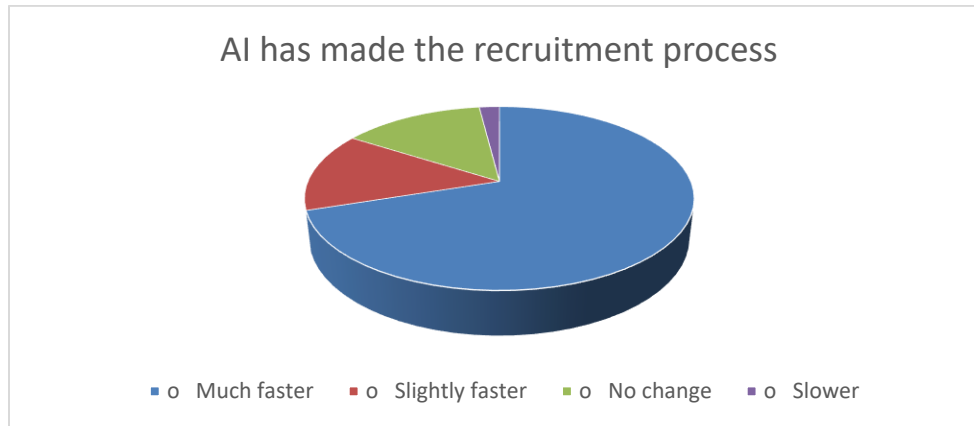


Figure no. 5.11: From the above graph we observe that AI has made the recruitment process in your organization 70 %Much faster, 14% Slightly faster, 14% no change, 2% slower.

12.Do you believe AI-based training programs are more effective than traditional training methods?

Variables	Respondents	Percentage
○ Strongly Agree	35	70%
○ Agree	7	14%
○ Neutral	4	8%
○ Disagree	2	4%
○ Strongly Disagree	2	4%

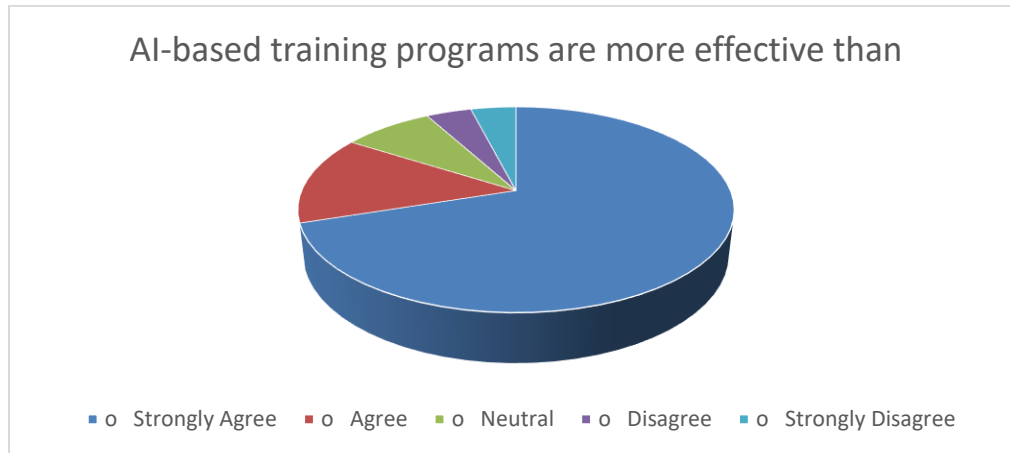


Figure no. 5.12: From the above graph we observe that AI-based training programs are more effective than traditional training methods 70% are Strongly Agree, 14% agree, 8% neutral, 4% disagree and 4% strongly disagree.

13. Do you think AI has reduced manual workload in HR activities?

Variables	Respondents	Percentage
<input type="radio"/> Strongly Agree	35	70%
<input type="radio"/> Agree	4	8%
<input type="radio"/> Neutral	2	4%
<input type="radio"/> Disagree	7	14%
<input type="radio"/> Strongly Disagree	2	4%

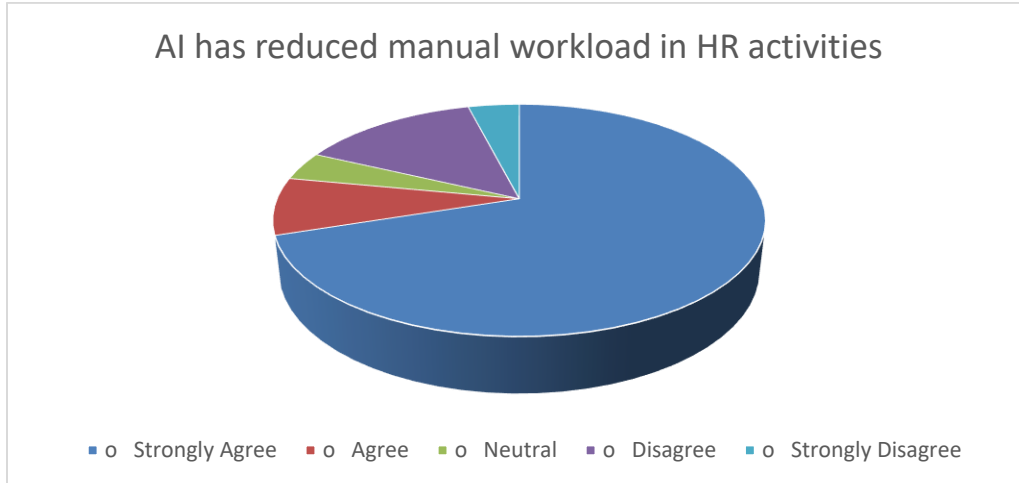


Figure no. 5.13: From the above graph we observe that think AI has reduced manual workload in HR activities 70% are Strongly Agree, 8% agree, 4% neutral, 14% disagree and 4% strongly disagree.

CONCLUSION

The integration of Artificial Intelligence (AI) in Human Resource Management (HRM) is significantly transforming the steel industry in Chhattisgarh. The study reveals that AI enhances efficiency in various HR functions such as recruitment, performance management, employee engagement, and training. Key benefits include faster hiring through automation, improved performance evaluation using predictive analytics, and personalized employee experiences via AI tools.

Despite its advantages, challenges like data privacy, high implementation costs, resistance to change, and the need for upskilling remain. Therefore, a balanced approach that combines AI capabilities with ethical standards and human oversight is essential.

Overall, AI presents a powerful opportunity for HR transformation. Companies that strategically implement AI while addressing associated challenges can improve HR effectiveness, boost employee satisfaction, and achieve sustainable organizational growth. Continued research is recommended to explore AI's long-term impact and potential for industry-specific customization in HRM.

REFERENCES

- https://www.researchgate.net/publication/374418190_Impact_of_Artificial_Intelligence_on_Human_Resource_Management
- <https://ijrar.org/papers/IJRAR22B1253.pdf>
- https://www.researchgate.net/publication/383084162_The_Impact_of_Artificial_Intelligence_on_Human_Resource_Management
- <https://chatbotslife.com/ai-recruiter-bot-for-candidate-acquisition-467812712262>
- <http://www.ijstr.org>
- <http://www.ijrar.org>

