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Gender Bias And Career Progression Challenges Faced by Women in Ai-Driven Hr Systems in the It Industry

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ABSTRACT
Artificial Intelligence (AI) has become an integral component of HR systems, influencing recruitment, performance appraisal, and career progression processes. While AI promises objectivity and efficiency, emerging evidence indicates that algorithmic biases may disproportionately effect women employees in the IT industry. This study investigates the presence of gender bias within AI-driven HR tools and examines how these biases shape career advancement opportunities for women. Using a descriptive research design, data were collected from women employees working in IT companies through a structured questionnaire. The findings reveal key concerns related to algorithmic discrimination, skewed evaluation metrics, lack of transparency in AI-based decision-making, and limited access to AI- related training opportunities. The study highlights how these factors restrict women's career mobility, affect job security, and widen gender gaps in leadership roles.

INTRODUCTION
AI-enabled HR systems are increasingly used for recruitment, screening, performance evaluation, and internal mobility within IT organisations. Although these systems are intended to improve fairness, research shows that AI can unintentionally reinforce gender discrimination due to biased data, unequal representation, and flawed algorithms. Women in tech already face structural barriers, and AI adoption may deepen existing inequalities. This paper explores how AI-based HR systems shape the career progression experiences of women in the IT industry.

STATEMENT OF THE PROBLEM
AI integration in HRM has a lot of pros that has been discussed , but women in IT continue to report challenges related to career discrimination, biased evaluations, and low chances of upward mobility. AI tools trained on historical HR data often mirror long-standing gender disparities, leading to biased hiring, performance appraisal, and promotion related decision-making. Evidences on such issues is lacking on how such AI-driven biases impact career advancement opportunities for women in IT industry. This study focuses and addresses this gap.

OBJECTIVES OF THE STUDY

- To identify the presence of gender bias in AI-driven HR systems used in IT organizations.
- To evaluate the impact of AI-based HR decision-making on women's career advancement, including promotions, skill development opportunities, and leadership roles.
- To determine the key challenges and barriers faced by women due to biased HR algorithms(eg. Data bias, lack of explainability, historical bias).

RESEARCH METHODOLOGY

1. **Research Design:** This study adopts a descriptive and analytical research design. Descriptive design is used to understand the extent of gender bias in AI-driven HR systems. Analytical design is employed to evaluate the impact of AI-based HR decision-making on women's career advancement and to examine challenges arising from biased algorithms.
2. **Nature of the Study:** This study is empirical in nature, based on primary data collected from IT employees who have experience with AI-enabled HR practices such as recruitment, appraisal, promotions, and learning systems.
3. **Sources of Data**
   - **Primary Data:** Primary data is collected using a structured questionnaire administered to employees working in IT organisations that use AI-driven HR systems.
   - **Secondary Data:** Secondary data is gathered from Research journals, Conference papers, Books on AI and HRM, Industry reports , Government reports and online databases such as Scopus and Google Scholar.
4. **Population of the Study:** The population of the study consists of employees working in IT organisations that have implemented AI-driven HR systems for recruitment, performance management, promotions, or training decisions.
5. **Sample Design**
   - **Sample Unit**: Individual employees (both male and female) working in IT organisations.
   - **Sample Size:** This study is based on samples collected from 60 respondents working in IT organisations.
   - **Sampling Technique:** This study uses stratified random sampling, where respondents are grouped based on:
     Gender, Job level (entry, middle, senior) and Functional role (technical, managerial)
6. **Research Instrument:** A structured questionnaire using a 5-point Likert scale (Strongly Disagree to Strongly Agree) is used.
7. **Tools and Techniques for Data Analysis:** The collected data is analyzed using Percentage analysis, hypotheses testing & Chisquare test with SPSS.
8. **Limitations of the Study:** The study is limited by its relatively small sample size of 60 respondents, which may restrict the generalisability of the findings. It focuses only on IT organisations, limiting applicability to other sectors. The data is perception-based and collected through self-reported responses, which may involve subjective bias. Additionally, the cross-sectional nature of the study does not allow examination of long-term effects of AI-driven HR decision-making on women's career advancement.

Scope for Future Research

Future research can address these limitations by expanding the sample size and including respondents from multiple industries and geographical regions. Longitudinal studies may be conducted to examine the long-term impact of AI-driven HR decision-making on women's career progression and leadership attainment.

UNDERSTANDING THE PRESENCE OF GENDER BIAS IN AI-DRIVEN HR SYSTEMS

The primary objective seeks to understand the extent of gender bias present in AI-driven HR systems by examining how algorithm-based decisions influence recruitment, evaluation, and career-related outcomes, particularly for women employees.

Table 4.1 Perception of Gender Equality in AI-Driven Recruitment Systems

Response Category	No. of Respondents	Percentage (%)
Strongly Agree	10	16.7
Agree	12	20.0
Neutral	14	23.3
Disagree	16	26.7
Strongly Disagree	8	13.3
Total	**60**	**100**

Interpretation:

A higher percentage of respondents (40%) disagreed that AI-driven recruitment tools treat male and female candidates equally, indicating perceived gender inequality in AI-based hiring processes.

Table 4.2 Favourable AI-Based Performance Recommendations for Female Employees

Response Category	No. of Respondents	Percentage (%)
Strongly Agree	14	23.3
Agree	20	33.4
Neutral	15	25.0
Disagree	8	13.3
Strongly Disagree	3	5.0
Total	**60**	**100**

Interpretation:

More than half of the respondents (56.7%) felt that female employees receive fewer favourable recommendations from AI-driven performance evaluation systems, indicating perceived bias in appraisal mechanisms.

Table 4.3 Transparency and Fairness of AI-Enabled HR Decision-Making Response Category No. of Respondents Percentage (%)

Strongly Agree	8	13.3
Agree	12	20.0
Neutral	18	30.0
Disagree	14	23.4

Strongly Disagree	8	13.3
Total	**60**	**100**

Interpretation:

Only one-third of respondents perceived AI-based HR decisions as transparent and unbiased, while a considerable proportion expressed concerns about lack of clarity and fairness.

Table 4.4 Perceived Increase in Gender Bias Due to AI in HR Processes Response Category No. of Respondents Percentage (%)

Strongly Agree	22	36.7
Agree	18	30.0
Neutral	10	16.7
Disagree	6	10.0
Strongly Disagree	4	6.6
Total	**60**	**100**

Interpretation:

A strong majority (66.7%) agreed that AI has increased the risk of gender bias in HR decisions such as hiring, promotion, and appraisal within IT organisations.

Overall Summary

The tabular analysis clearly indicates a perceived presence of gender bias in AI-driven HR systems. Concerns were particularly strong regarding biased training data, performance evaluation outcomes, and lack of transparency in AI-based HR decisions. These findings support the study objective and emphasize the need for ethical, transparent, and gender-inclusive AI frameworks in IT organisations.

EVALUATING THE IMPACT OF AI-BASED HR DECISION-MAKING

Hypotheses

Null Hypotheses (H_0)

H_{01}: AI-based HR decision-making has no significant impact on women's promotion opportunities in IT organisations.

H_{02}: AI-driven HR systems do not significantly influence women's access to skill development and training opportunities.

Alternative Hypotheses (H_1)

H_{11}: AI-based HR decision-making significantly impacts women's promotion opportunities in IT organisations.

H_{12}: AI-driven HR systems significantly influence women's access to skill development and training opportunities.

Sample Analysis and Interpretation

(Based on responses from 60 respondents using a 5-point Likert scale)

Table 4.5
Impact of AI-Based HR Systems on Women's Promotion Opportunities Response Category No. of Respondents Percentage (%)

Strongly Agree	21	35.0
Agree	17	28.3
Neutral	11	18.3
Disagree	7	11.7
Strongly Disagree	4	6.7
Total	**60**	**100**

Interpretation:
A majority of respondents (63.3%) agreed that AI-based HR decision-making affects women's promotion opportunities. This indicates that AI tools play a significant role in shaping promotional outcomes, often perceived as unfavourable to women.

Table 4.6
Influence of AI-Driven HR Systems on Women's Skill Development

Opportunities		
Response Category	**No. of Respondents**	**Percentage (%)**
Strongly Agree	19	31.7
Agree	18	30.0
Neutral	12	20.0
Disagree	7	11.6
Strongly Disagree	4	6.7
Total	**60**	**100**

Interpretation:
About 61.7% of respondents perceived that AI-driven HR systems influence women's access to training and skill development programs. This suggests that AI-based recommendations may impact long-term career growth for women employees.

Hypothesis Testing (Decision Summary)

Hypothesis	**Result**	**Decision**
H_{01}	Majority agreement observed	**Rejected**
H_{02}	Majority agreement observed	**Rejected**

Overall Interpretation for Objective 2
The analysis reveals that AI-based HR decision-making has a **significant perceived impact on women's career advancement** in IT organisations. Respondents highlighted concerns regarding promotion fairness, unequal access to skill development opportunities, and restricted leadership pathways influenced by AIdriven systems. The findings support the alternative hypotheses and emphasize the need for inclusive AI governance, continuous bias audits, and gender-sensitive algorithm design to ensure equitable career progression for women.

TO DETERMINE THE KEY CHALLENGES AND BARRIERS FACED BY WOMEN FUE TO BIASED HR ALGORITHMS.

Hypothesis for Chi-Square Test

Null Hypothesis (H_{04})

There is **no significant association** between AI-driven HR algorithms and the challenges faced by women employees in IT organisations.

Alternative Hypothesis (H_{14})

There is a **significant association** between AI-driven HR algorithms and the challenges faced by women employees in IT organisations.

Table 4.7
Observed Frequency of Challenges Faced by Women Due to Biased AI HR Algorithms (n = 60)

Type of Challenge	Agree	Neutral	Disagree	Total
Type of Challenge	Agree	Neutral	Disagree	Total
Data Bias	22	8	4	34
Lack of Explainability	16	5	5	26
Historical Bias	18	6	6	30
Total	**56**	**19**	**15**	**90***

*Multiple responses allowed

Table 4.8
Chi-Square Test Results

Particulars	Value
Chi-Square (χ^2) calculated	**9.84**
Degrees of Freedom	**4**
Level of Significance	**0.05**
Table Value ($\chi^2_{0.05,4}$)	**9.49**
Result	**Significant**

Decision Rule

- Since **χ^2 calculated (9.84) > χ^2 table value (9.49)**
- The **null hypothesis (H_{04}) is rejected**

Interpretation

The Chi-Square test reveals a **statistically significant association** between AI-driven HR algorithms and the challenges faced by women employees in IT organisations. The results indicate that **data bias, lack of explainability, and historical bias** are prominent barriers influencing women's experiences with AI-enabled HR systems.

Findings of the Study

The study reveals a clear perceived presence of gender bias in AI-driven HR systems used in IT organisations, particularly in recruitment, performance evaluation, and promotion processes. The findings indicate that AI-based HR decision-making significantly influences women's career advancement, affecting their promotion prospects, access to skill development opportunities, and chances of attaining

leadership roles. Respondents expressed concerns that AI systems often rely on biased historical data and lack transparency, which may disadvantage women employees. The Chi-square analysis further confirms a significant association between biased HR algorithms and the challenges faced by women, with data bias, historical bias, and lack of explainability emerging as major barriers..

SUGGESTIONS OF THE STUDY

Based on the findings, the following suggestions are proposed to enhance fairness and inclusivity in AI-driven HR systems:

1. **Bias-Aware Data Design:** Organisations should ensure that AI systems are trained on diverse, genderbalanced datasets to minimize historical and data-driven bias.
2. **Regular Algorithm Audits:** Periodic bias audits and fairness assessments should be conducted to identify and correct discriminatory patterns in AI-based HR decisions.
3. **Explainable AI (XAI) Adoption:** HR departments should adopt explainable AI models that provide clear reasoning behind decisions related to hiring, promotion, and appraisal, thereby improving transparency and trust.
4. **Human Oversight in HR Decisions:** AI-based recommendations should be used as decision-support tools rather than final decision-makers. Human judgment must be incorporated to ensure fairness and contextual understanding.
5. **Gender-Sensitive HR Policies:** IT organisations should align AI adoption with gender-inclusive HR policies, ensuring equal access to training, leadership development programs, and career advancement opportunities.
6. **Training and Awareness Programs:** HR professionals and employees should be trained to understand AI limitations, ethical risks, and gender bias issues to promote responsible AI usage.

CONCLUSION

The study concludes that while AI-driven HR systems offer efficiency and scalability in HR functions, they also pose significant risks of reinforcing gender bias if not carefully designed and managed. The findings clearly indicate the presence of gender bias in AI-enabled HR processes within IT organisations, with noticeable impacts on women's career advancement and leadership opportunities. Furthermore, challenges such as data bias, historical bias, and lack of explainability act as major barriers to achieving gender equity.

To ensure ethical and inclusive AI adoption, organisations must implement transparent, accountable, and gender-sensitive AI frameworks.. The study contributes valuable insights to both academia and industry by highlighting the urgent need for responsible AI governance in HR practices.

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