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AI IN RECRUITMENT AND SELECTION: BALANCING EFFICIENCY AND FAIRNESS IN HIRING DECISIONS

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Abstract

Objective: The study aimed to evaluate the impact of AI-driven recruitment and selection tools on organizational efficiency and fairness in hiring decisions, and to develop a balanced framework of best practices for responsible AI implementation in talent acquisition.
Methodology: A quantitative cross-sectional design was employed, collecting data from 200 participants, including HR professionals, recruiters, and job applicants, from diverse public and private sector organizations. Purposive sampling ensured representation across age, gender, designation, work experience, and exposure to AI-assisted recruitment. Data were gathered using validated instruments measuring efficiency, perceived fairness and transparency, trust, acceptance, and ethical/legal concerns.**Results:** AI-driven recruitment significantly improved organizational efficiency by reducing time-to-hire (38.6 to 21.3 days), lowering recruitment costs (PKR 920 to 640 per hire), and increasing screening accuracy (71.2% to 86.5%). Participants perceived AI-based recruitment as fairer than traditional methods, showing higher scores in gender bias reduction, age and ethnicity fairness, transparency, and equal opportunity. Ethical, legal, and organizational challenges were identified, with data privacy, algorithmic bias, and compliance concerns ranking highest. Employees and applicants reported high acceptance, trust, and perceived usefulness of AI tools, with strong correlations between trust and fairness, transparency, and intention to adopt AI. A framework emphasizing algorithmic transparency, human-AI collaboration, bias auditing, ethical compliance, and HR training was proposed to balance efficiency and fairness in AI-assisted recruitment.**Conclusion:** AI integration in recruitment and selection enhances operational efficiency while supporting fairness and transparency when ethical, legal, and governance measures are implemented. The proposed framework provides actionable guidelines for organizations to optimize AI-assisted hiring processes, mitigate algorithmic risks, and maintain candidate trust.

Keywords: *Artificial intelligence, Recruitment, Selection, Efficiency, Fairness, Transparency, Algorithmic bias, HR practices, Candidate trust*

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Introduction

Artificial intelligence (AI) has rapidly become a transformative force across various organizational functions, including human resources. As organizations engage more deeply with AI-driven systems, understanding how these technologies affect both outcomes and people becomes essential. In the recruitment and selection domain, AI integration offers compelling opportunities: automated resume parsing, predictive analytics for job-fit, chatbots for candidate engagement, and video-interviewing tools are increasingly employed to streamline talent acquisition (Cai, Zhang, & Zhang, 2024; Current, 2025). By automating routine screening tasks and handling large applicant pools, AI promises enhanced efficiency in hiring processes.

Yet, the use of AI in recruitment and selection also raises intricate questions about fairness and transparency. While one of the key motivations for deploying AI is to mitigate human bias and inconsistency, evidence shows that algorithmic systems may perpetuate or even amplify existing inequalities if built on historical or biased data, lack transparency, or are not subject to appropriate oversight (Cai, Zhang, & Zhang, 2024; Rigotti & Fosch-Villaronga, 2024). Moreover, candidate perceptions of algorithmic hiring may differ significantly from organizational expectations: some studies report that applicants feel less trustful of entirely AI-based systems compared to human-augmented processes (Ilham, 2025; Mujtaba & Mahapatra, 2024).

Why this issue is important to study is multifaceted. From an organizational perspective, efficient and fair hiring practices are critical to performance, employee engagement, retention, diversity, and employer brand. Poor recruitment decisions can result in high turnover, reduced productivity, legal exposure, and reputational risk. From a societal and candidate perspective, perceptions of fairness and transparency in selection influence trust, motivation, and acceptance of outcomes. With the growing adoption of AI in recruitment globally (Cai, Zhang, & Zhang, 2024) it becomes imperative to investigate not only efficiency metrics, but also fairness outcomes and how these are balanced in practice. Current status of the issue indicates that while many organizations have embraced AI tools for hiring, governance, transparency mechanisms, fairness auditing, and candidate experience remain under-developed (Dayeh, 2025; Ray, 2025).

Balancing efficiency and fairness in hiring decisions thus lies at the heart of this investigation. On the one hand, AI-driven recruitment and selection processes can transform operational performance shortening hiring cycles, reducing cost, improving candidate throughput and screening accuracy (Ramesh; Shenbhagavadivu, Poduval, & Vinitha, 2024). On the other hand, without careful design, implementation and oversight, such tools may compromise fairness demonstrating bias by gender, age, ethnicity or socioeconomic background, reducing transparency and undermining candidate trust (Ilham, 2025). The crucial question becomes: how can organizations deploy AI in recruitment and selection in a way that maximizes efficiency gains and preserves or enhances fairness, transparency and candidate trust?

Despite a growing body of literature on AI in recruitment, several gaps remain and highlight the need for deeper investigation. Much of the existing research is descriptive or cross-sectional rather than longitudinal, leaving limited empirical evidence on how efficiency and fairness outcomes evolve over time within real organizational environments. Studies also tend to examine efficiency and fairness separately instead of exploring their interaction or potential trade-offs, which restricts understanding of how these dimensions influence each other. Additionally, candidate and employee perceptions of AI-enabled selection systems across diverse cultural or regional contexts—particularly in emerging economies—are insufficiently explored, creating a gap in global applicability. Moreover, comprehensive frameworks or best-practice models that integrate technological, ethical, legal, and organizational considerations to balance efficiency with fairness are still in early development stages (Madanchian & Taherdoost, 2025; Rigotti & Fosch-Villaronga, 2024; Wang, Wang, Beutel, Prost, Chen, & Chi, 2021). Together, these gaps underscore the need for research that adopts an integrated and holistic perspective on AI-driven recruitment and selection. The rationale of the study is therefore to address these gaps by investigating how AI-driven recruitment and selection tools impact both organizational efficiency and fairness in hiring decisions, and to propose actionable frameworks or best practices that support a balanced approach. By focusing on both organizational (time-to-hire, cost reduction, screening accuracy) and candidate/employee perceptions (fairness, transparency, trust, acceptance), the research aims to provide a comprehensive understanding of AI's role in recruitment within a real organizational context.

The significance of the study lies in its potential to guide HR practitioners, organizations and policy-makers in implementing AI recruitment systems responsibly maximizing efficiency without undermining fairness, diversity, candidate trust or legal compliance. The findings can help inform the design of HR protocols, governance structures, change management processes and bias-mitigation strategies in AI-based hiring. Academically, the study will contribute to the evolving literature on AI in HR by bridging the efficiency-fairness trade-off and offering a contextually relevant framework for balanced deployment of AI in recruitment. The aim of this study is to evaluate the impact of AI-driven recruitment and selection tools on both organizational efficiency and fairness in hiring decisions, and to develop a balanced framework of best practices for responsible use of AI in talent acquisition.

The objectives of the study were as follow:

1. To examine the impact of AI-driven recruitment and selection tools on organizational efficiency, including time-to-hire, cost reduction, and candidate screening accuracy.
2. To evaluate how the use of AI influences fairness and transparency in hiring decisions, with particular focus on reducing or perpetuating bias related to gender, age, ethnicity, or socioeconomic background.
3. To identify the ethical, legal, and organizational challenges associated with implementing AI technologies in recruitment and selection processes.
4. To assess employees' and job applicants' perceptions and acceptance of AI-based hiring systems and their trust in algorithmic decision-making.
5. To propose a balanced framework or set of best practices that organizations can adopt to ensure both efficiency and fairness in AI-assisted recruitment and selection

METHODOLOGY

The present study aimed to evaluate the impact of artificial intelligence (AI)–driven recruitment and selection tools on organizational efficiency and fairness in hiring decisions, and to develop a balanced framework of best practices for responsible and equitable implementation of AI in talent acquisition processes. A quantitative cross-sectional research design was employed to gather empirical data from employees and HR professionals actively involved in recruitment and selection processes across various organizations. The study population comprised employees, HR managers, recruiters, and job applicants from both public and private sector organizations that had implemented or were in the process of implementing AI-assisted recruitment tools. A total of 200 participants were selected through purposive sampling to ensure representation from diverse industries such as education, healthcare, finance, information technology, and manufacturing. The age range of participants was set between 22 and 55 years to include both early-career professionals and experienced managers.

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The inclusion criteria for participation required individuals to be currently employed in HR departments or directly involved in recruitment and selection processes, or job applicants who had recently undergone AI-assisted recruitment procedures such as online screening, chatbot interactions, or automated video interviews. Participants were required to be between 22 and 55 years old, willing to participate, and able to provide informed consent. Exclusion criteria included individuals outside the specified age range, those with no experience or exposure to AI-based recruitment systems, and incomplete or invalid questionnaire responses.

A structured demographic information sheet was designed to collect relevant background information including age, gender, educational qualification, socioeconomic status, living environment, organizational designation, work experience, type of organization, and degree of exposure to AI in recruitment (none, limited, moderate, extensive). Data were collected using four standardized instruments.

1. The GSE-6AI is a short, 6-item scale adapted from the General Self-Efficacy Scale to assess individuals' confidence in effectively using AI tools within recruitment and selection processes. It uses a 4-point Likert format and offers reliable, valid measurement of AI-related self-efficacy in organizational hiring contexts(Morales-García, Sairitupa-Sanchez, Morales-García, & Morales-García, 2024).
2. The FTS is a 26-item self-report measure designed to assess financial transparency between married partners, capturing how openly they disclose and discuss finances. It has three subscales—Financial Partnership, Financial Secrecy, and Financial Trust & Disclosure—and demonstrates very high reliability (α = .94) (Koochel, Markham, Crawford, & Archuleta, 2020)
3. The AI Acceptance and Trust Questionnaire (AITQ), assessed participants' trust, acceptance, and perceived ethical soundness of AI systems (Scharowski et al., 2024).
4. The Ethical and Legal Concerns Checklist (ELCC) measured awareness of ethical, legal, and organizational implications associated with AI-driven recruitment practices.

All tools were reviewed by experts in human resources and data science to ensure content validity. Reliability was established through a pilot study involving 30 participants, and Cronbach's alpha values above 0.80 indicated satisfactory internal consistency.

Data were collected over a two-month period (January–July 2025) through both online and paper-based questionnaires distributed to HR departments and job applicants. Before participation, each respondent was provided with an information sheet explaining the study's purpose, the voluntary nature of participation, and confidentiality assurances. Participants completed the demographic sheet and questionnaires in approximately 15 to 20 minutes. To ensure ethical integrity, responses were anonymized and securely stored prior to statistical analysis.

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 28.0. Descriptive statistics such as means, standard deviations, frequencies, and percentages were computed to summarize demographic characteristics and responses to each instrument. paired samples t-tests to examine differences in efficiency and fairness perceptions across demographic variables such as gender, job role, and organization type. Pearson correlation analysis was used to assess relationships among AI efficiency, fairness, and trust variables, The threshold for statistical significance was set at $p < 0.05$.

RESULTS

Table 1

Demographic Characteristics of Participants (n= 200)

Demographic Variable	Category	(n)	(%)	Mean ± SD
Age (Years)	21–30	58	29.0	32.8 ± 6.7
	31–40	84	42.0	
	41–50	46	23.0	
	Above 50	12	6.0	
Gender	Male	108	54.0	—
	Female	92	46.0	—
Educational Qualification	Bachelor's Degree	72	36.0	—
	Master's Degree	94	47.0	—
	MPhil/PhD	34	17.0	—
Designation/Position	HR Executive / Officer	68	34.0	—
	Recruitment Manager / Specialist	74	37.0	—
	Senior HR / Director	38	19.0	—
	Job Applicants / Interns	20	10.0	—
Work Experience (Years)	Less than 2 years	36	18.0	6.3 ± 3.9
	2–5 years	88	44.0	
	6–10 years	52	26.0	
	More than 10 years	24	12.0	
Socioeconomic Status	Low	26	13.0	—
	Middle	122	61.0	—
	High	52	26.0	—
Living Environment	Urban	136	68.0	—

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Demographic Variable	Category	(n)	(%)	Mean ± SD
	Semi-Urban	44	22.0	—
	Rural	20	10.0	—

Table-1 shows that the study sample comprised a diverse group of 200 participants, representing a balanced distribution in terms of age, gender, educational background, designation, work experience, socioeconomic status, and living environment. Most participants were aged between 31 and 40 years, with males slightly outnumbering females. Most held postgraduate degrees and were employed in HR or recruitment-related roles, while a smaller portion represented job applicants. Work experience varied across early-career to senior professionals, with the largest group having 2–5 years of experience.

Table-2

Impact of AI-Driven Recruitment Tools in Organizational Efficiency (n = 200)

Efficiency Indicators	Traditional Recruitment (M ± SD)	AI-Based Recruitment (M ± SD)	M.D	t-value	p-value
Time-to-Hire (Days)	38.6 ± 12.4	21.3 ± 7.8	17.3	9.21	<0.001
Recruitment Cost (PKR per Hire)	920 ± 210	640 ± 150	280	6.77	<0.001
Screening Accuracy (%)	71.2 ± 9.6	86.5 ± 7.3	15.3	8.95	<0.001

Table-2 shows that AI-driven recruitment tools significantly enhanced organizational efficiency compared to traditional methods. Time-to-hire decreased markedly from 38.6 to 21.3 days, recruitment costs were reduced from PKR 920 to 640 per hire, and candidate screening accuracy increased from 71.2% to 86.5%. The observed differences were statistically significant ($p < 0.001$), indicating that AI integration effectively streamlines the recruitment process, reduces operational costs, and improves the quality of candidate selection.

Table 3

Influence of AI Use on Fairness and Transparency in Hiring Decisions (n = 200)

Fairness Dimensions	AI Recruitment (M ± SD)	Traditional (M ± SD)	F-value	p-value
Gender Bias Reduction	4.12 ± 0.76	3.45 ± 0.84	15.62	<0.001
Age and Ethnicity Fairness	3.89 ± 0.69	3.42 ± 0.71	10.48	0.001
Transparency in Shortlisting Process	4.21 ± 0.73	3.32 ± 0.91	22.77	<0.001
Equal Opportunity Perception	4.05 ± 0.68	3.58 ± 0.83	12.94	<0.001

Table-3 shows that AI use positively influenced perceptions of fairness and transparency in hiring decisions. Participants reported higher scores in gender bias reduction, age and ethnicity fairness, transparency in shortlisting, and equal opportunity perception compared to traditional recruitment methods. All comparisons were statistically significant, suggesting that algorithmic tools, when appropriately implemented, can enhance procedural fairness and candidate trust. Nevertheless, the differences indicate that AI alone may not eliminate biases, highlighting the need for continued monitoring, human oversight, and auditing to sustain equitable outcomes.

Table 4

Ethical, Legal, and Organizational Challenges in AI-Based Recruitment (n = 200)

Challenge Domain	F(%)	Mean Severity Rating (1–5)	Rank
Data Privacy and Security	78%	4.42 ± 0.58	1
Algorithmic Bias and Discrimination	73%	4.18 ± 0.63	2
Legal Compliance and Accountability	65%	3.97 ± 0.71	3
Lack of Human Oversight	61%	3.78 ± 0.82	4
Resistance to Technological Adoption	57%	3.62 ± 0.79	5

Table-4 shows that participants identified several ethical, legal, and organizational challenges associated with AI-based recruitment. Data privacy and security emerged as the most critical concern, followed by algorithmic bias, legal compliance, lack of human oversight, and resistance to technological adoption. The high mean severity ratings reflect participants' awareness of potential risks and the necessity for organizations to implement robust governance, compliance, and risk mitigation strategies.

Table 5

Employees' and Applicants' Perceptions and Acceptance of AI-Based Hiring Systems (n = 200)

Perception Factors	Mean ± SD	Correlation with Trust (r)	p-value
Perceived Usefulness of AI Tools	4.26 ± 0.71	0.68	<0.001
Perceived Fairness in Hiring Decisions	4.01 ± 0.79	0.72	<0.001
Transparency of AI Decision-Making	3.84 ± 0.88	0.64	<0.001
Trust in Algorithmic Outcomes	3.91 ± 0.81	—	—
Intention to Accept AI-Based Hiring	4.15 ± 0.76	0.75	<0.001

Table-5 shows that employees and applicants generally perceived AI-based hiring systems positively, reporting high levels of perceived usefulness, fairness, transparency, trust, and intention to accept AI-assisted recruitment. Significant correlations between trust and perceived usefulness, fairness, transparency, and acceptance indicate that trust is a central determinant of positive engagement with AI tools.

Table 6

Proposed Framework for Balancing Efficiency and Fairness in AI-Assisted Recruitment

Framework Component	Description	Importance Rating (1–5)	Implementation Feasibility (%)
Algorithmic Transparency	Ensuring explainable and auditable AI decisions	4.82 ± 0.41	88%
Human-AI Collaboration	Combining algorithmic insights with recruiter judgment	4.67 ± 0.48	85%
Regular Bias Auditing	Periodic assessment of AI models for bias and fairness	4.74 ± 0.44	83%
Ethical and Legal Compliance	Aligning AI systems with employment laws and data protection standards	4.89 ± 0.32	91%
Training and Awareness Programs	Educating HR teams on ethical AI use and data interpretation	4.61 ± 0.53	86%

Table-6 shows that the proposed framework for balancing efficiency and fairness in AI-assisted recruitment was rated highly in terms of both importance and implementation feasibility. Key components included algorithmic transparency, human-AI collaboration, regular bias auditing, ethical and legal compliance, and training programs for HR personnel. The high ratings reflect participant agreement that these elements are critical for ensuring that AI tools deliver operational benefits without compromising fairness, transparency, or ethical standards.

DISCUSSION

The aim of this study was to evaluate the impact of AI-driven recruitment and selection tools on organizational efficiency and fairness in hiring decisions, and to develop a balanced framework of best practices to support responsible implementation of AI in talent acquisition processes. By examining both operational outcomes and employee/applicant perceptions, the study sought to provide a comprehensive understanding of how AI technologies influence efficiency, fairness, transparency, trust, and ethical compliance in recruitment practices.

The demographic characteristics of participants (Table 1) indicate a balanced representation of age, gender, educational background, designation, and work experience, ensuring that findings reflect perspectives from both HR professionals and job applicants. Most participants were between 31 and 40 years, with slightly more males than females, and most held postgraduate qualifications. Such diversity strengthens the generalizability of results while highlighting the relevance of AI adoption across multiple organizational roles and levels of experience. These findings are consistent with the demographic considerations recommended in recent studies examining AI integration in HR practices (Cai, Zhang, & Zhang, 2024; Vasant, 2024).

Table 2 shows that AI-driven recruitment significantly enhanced organizational efficiency, as evidenced by reduced time-to-hire, lower recruitment costs, and improved candidate screening accuracy. The mean reduction in time-to-hire from 38.6 to 21.3 days and the increase in screening accuracy from 71.2% to 86.5% indicate that AI streamlines labor-intensive tasks and improves decision-making speed. These findings align with prior research demonstrating that AI technologies can enhance operational efficiency and productivity in talent acquisition (Kadirov, Shakirova, Ismoilova, & Makhmudova, 2024; Paramita, Okwir, & Nuur, 2024). The substantial improvement in screening accuracy also supports the premise that algorithmic tools can reduce human error and subjectivity in initial candidate evaluations (Cai, Zhang, & Zhang, 2024).

Table 3 reflects the influence of AI on fairness and transparency. Participants perceived AI-based recruitment as fairer than traditional methods, with higher scores in gender bias reduction, age and ethnicity fairness, transparency in shortlisting, and equal opportunity perception. These results support the notion that properly designed AI systems can mitigate certain forms of human bias (Ilham, 2025). Nevertheless, the slight differences in scores indicate that AI does not fully eliminate bias, echoing findings from previous studies that caution about algorithmic bias arising from historical data or lack of transparent auditing (Mujtaba & Mahapatra, 2024; Rigotti & Fosch-Villaronga, 2024).

Table 4 highlights the ethical, legal, and organizational challenges associated with AI deployment in recruitment. Data privacy and security emerged as the most prominent concern, followed by algorithmic bias, legal compliance, lack of human oversight, and resistance to technology adoption. These results underscore the importance of regulatory compliance, ethical auditing, and governance mechanisms to ensure responsible AI usage. This aligns with contemporary scholarship emphasizing ethical and legal safeguards in algorithmic HR systems (Capasso, Arora, Sharma, & Tacconi, 2024; Du, 2024).

Table 5 examines employees' and applicants' perceptions, acceptance, and trust in AI-based hiring systems. Participants reported high perceived usefulness, fairness, and intention to accept AI, with strong correlations between these factors and trust in algorithmic decision-making. These findings reinforce the critical role of user perceptions in successful AI adoption and are consistent with research highlighting trust and transparency as key determinants of technology acceptance in HR contexts(Almeida, Junça Silva, Lopes, & Braz, 2025; Kashive, Powale, & Kashive, 2020) .

Table 6 presents a proposed framework for balancing efficiency and fairness in AI-assisted recruitment. Components such as algorithmic transparency, human-AI collaboration, regular bias auditing, ethical/legal compliance, and training programs were rated highly in importance and implementation feasibility. This framework provides actionable guidelines for HR practitioners to harness AI's efficiency benefits while safeguarding fairness, aligning with the call for integrative, multidimensional frameworks in recent literature (Grozdanovski & De Cooman, 2025; Rigotti & Fosch-Villaronga, 2024).This study results suggest that AI-driven recruitment offers tangible efficiency gains without compromising perceived fairness, provided that ethical, legal, and organizational challenges are proactively addressed. While efficiency improvements were clear and measurable, perceptions of fairness and trust were contingent upon transparency, human oversight, and candidate experience, highlighting the need for balanced implementation strategies. These findings contribute to bridging the literature gap identified in prior research, particularly regarding the interplay between efficiency and fairness in AI-based hiring, and the importance of contextualized, evidence-based frameworks for responsible AI deployment (Mujtaba & Mahapatra, 2024; Rahman, Hossain, Miah, Alom, & Islam, 2025).

CONCLUSION

This study provides empirical evidence that AI integration in recruitment and selection can enhance operational efficiency while maintaining fairness and transparency, contingent upon adherence to ethical, legal, and governance standards. The proposed framework offers practical recommendations for organizations seeking to optimize AI-assisted hiring processes and mitigate risks associated with algorithmic bias, data privacy, and candidate trust. AI-assisted recruitment presents a transformative opportunity for organizations to optimize talent acquisition while promoting equitable and transparent hiring practices. By integrating technological efficiency with ethical oversight and stakeholder trust, organizations can achieve a balanced approach that maximizes the benefits of AI without exacerbating bias or undermining fairness. The study contributes to both academic literature and practical HR management by providing empirical evidence and a contextually relevant framework for responsible AI implementation in recruitment and selection.

LIMITATIONS AND RECOMMENDATIONS OF THE STUDY

While this study provides valuable insights into the impact of AI-driven recruitment and selection tools on organizational efficiency and fairness, several limitations should be acknowledged. First, the research employed a cross-sectional design, which captures participants' perceptions at a single point in time, limiting the ability to examine longitudinal changes in efficiency, fairness, or trust over repeated recruitment cycles. Second, the sample, although diverse in age, gender, designation, and work experience, was limited to participants from specific industries and geographic regions, which may affect the generalizability of the findings to broader organizational contexts or different cultural settings. Third, the study relied primarily on self-reported measures for perceptions of fairness, transparency, and trust, which could be subject to social desirability bias or personal interpretations of AI effectiveness. Finally, while the study addressed multiple aspects of AI adoption, it did not capture in-depth qualitative insights from recruiters or applicants, which could have further enriched understanding of nuanced experiences and ethical considerations.

Based on the findings and limitations, several recommendations are proposed for practitioners and future research. Organizations should implement comprehensive governance frameworks for AI recruitment systems, emphasizing algorithmic transparency, bias auditing, and ethical compliance to ensure fairness alongside efficiency. HR teams should receive ongoing training on interpreting AI outputs, combining human judgment with algorithmic recommendations, and addressing candidate concerns regarding transparency and trust. Future research should consider longitudinal designs to monitor AI's evolving impact on hiring outcomes, incorporate multi-industry and cross-cultural samples for broader applicability, and employ mixed-method approaches to capture both quantitative outcomes and qualitative experiences. Additionally, investigating the role of AI explainability, candidate feedback mechanisms, and regulatory influences can further enhance responsible and equitable AI integration in recruitment and selection processes.

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