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AI vs. Human Matchmakers: Evaluating Customer Perceptions, Trust, and Ethical Concerns in AI-Driven Marriage and Matchmaking Services

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Abstract: ***Artificial intelligence (AI) is reshaping industries, including the marriage and matchmaking sector, through AI-driven chatbots that facilitate partner selection, compatibility analysis, and user engagement. This study examines customer perceptions, trust dynamics, and ethical concerns associated with AI-powered matchmaking services, particularly in comparison to human matchmakers. Using a mixed-methods approach combining qualitative surveys and statistical analysis, this research investigates trust factors, data privacy apprehensions, and AI's limitations in processing emotional intelligence. Results indicate that while AI enhances efficiency through data-driven recommendations and pattern recognition, scepticism persists due to concerns about algorithmic bias, lack of human empathy, and ethical transparency. Moreover, AI chatbots struggle with nuanced interpersonal cues, raising questions about their reliability in emotionally sensitive decisions. The study suggests that a hybrid AI-human matchmaking model, integrating machine learning-driven suggestions with human oversight, could improve user trust and adoption. By addressing privacy safeguards, regulatory compliance, and AI explainability, the matchmaking industry can responsibly harness AI's potential while preserving human intuition. These insights contribute to the broader discourse on AI's role in human-centric decision-making and its ethical deployment in relationship-based industries.***
Keywords: AI matchmaking, algorithmic bias, chatbot ethics, AI trust, hybrid matchmaking models

I. INTRODUCTION

The advent of Artificial Intelligence (AI) in matchmaking has transformed the landscape of partner selection, disrupting the age-old reliance on human intuition, cultural norms, and interpersonal judgment. AI-driven matchmaking platforms employ sophisticated machine learning models, neural networks, and behavioural analytics to generate compatibility predictions, promising enhanced efficiency, objectivity, and scalability in relationship formation. However, despite these advancements, the trust, ethical validity, and human-centric limitations of AI matchmaking remain highly debated.

Existing matchmaking paradigms—both human and AI-driven—operate on the fundamental principles of similarity assessment, compatibility prediction, and decision support (Munz et al., 2013). While traditional matchmaking relies on subjective factors such as emotional intelligence, social intuition, and shared cultural values, AI matchmaking shifts the paradigm toward algorithmic decision-making, often leveraging extensive personal datasets, psychological profiling, and predictive analytics (Palanisamy & Muralidharan, 2024). The transition from human expertise to AI automation raises critical questions: Can AI truly replicate human matchmakers' intuitive understanding? Do users trust algorithmic recommendations over human intervention? What ethical and cognitive challenges emerge when AI governs intimate decision-making?

One of the most pressing challenges in AI matchmaking is algorithmic bias and fairness (Bahangulu & Berko, 2025). Bias in training data, feedback loops, and optimization objectives can lead to exclusionary outcomes, stereotype reinforcement, and ethical concerns in partner selection. Prior research indicates that bias in AI-powered dating algorithms can subtly influence user preferences, altering relationship dynamics based on pre-defined criteria rather than genuine human attraction (Palanisamy & Muralidharan, 2024). As matchmaking becomes increasingly AI-driven, ensuring fairness, transparency, and explainability in recommendation systems is paramount to prevent discrimination and social segmentation.

Beyond fairness, user perception and trust in AI matchmaking are central to adoption and engagement. Studies indicate that trust in AI-driven decisions is influenced by explainability, emotional intelligence, and perceived authenticity (Hoffmann et al., 2022). Unlike human matchmakers, AI lacks the ability to contextualize personal narratives, gauge non-verbal cues, or integrate nuanced emotional considerations.

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Users often perceive AI-generated matches as mechanistic or impersonal, which affects engagement rates, perceived relationship quality, and overall satisfaction with the matchmaking process (Bajpai & Kapoor, 2023). Thus, the psychological and cognitive dimensions of AI matchmaking require further exploration to bridge the gap between algorithmic predictions and human relational expectations.

A significant concern in AI-driven matchmaking revolves around data privacy and ethical oversight. These platforms analyse extensive personal data, including psychological evaluations, user interactions, and behavioural tendencies, raising questions about user consent, data security, and potential algorithmic manipulation (Sharma et al., 2023). While regulatory measures such as GDPR and AI ethics guidelines seek to safeguard user information, ensuring global compliance and transparency remains a persistent challenge. Establishing ethical AI governance frameworks is essential to enhancing trust and ensuring responsible AI integration in matchmaking technologies.

This study explores the synergy between AI-driven and human matchmaking by assessing customer trust, perceptions, and ethical dilemmas surrounding AI-powered partner selection. Through an in-depth examination of existing literature and data-driven analysis:

1) 0This study explores how algorithmic bias impacts matchmaking precision and the perception of fairness.
2) User attitudes toward AI versus human matchmaking, particularly in terms of authenticity and emotional intelligence.
3) Ethical implications of AI matchmaking, including privacy concerns, bias reduction strategies, and regulatory governance.

By addressing these aspects, this study contributes to the ongoing discourse on AI ethics, human-centred design, and the technological evolution of matchmaking services. The insights gained will be valuable for AI developers, policymakers, and users, ensuring a harmonious balance between AI automation and human expertise in the future of matchmaking.

II. LITERATURE REVIEW

A. Introduction

The integration of artificial intelligence (AI) in matchmaking has revolutionized the dating landscape, offering data-driven compatibility predictions that claim to outperform traditional human matchmakers. AI-powered matchmaking services employ machine learning, data analytics, and psychological profiling to enhance matchmaking accuracy. However, concerns about trust, algorithmic biases, and ethical implications persist. This review critically evaluates existing research on AI-driven matchmaking, comparing its effectiveness to human matchmakers and examining user perceptions, ethical dilemmas, and research gaps.

B. Theoretical Foundations of Matchmaking

Matchmaking theories provide essential frameworks for understanding relationship compatibility. Social Exchange Theory (Blau, 1964) suggests that individuals seek relationships with the highest rewards at the lowest cost, which AI systems operationalize through algorithmic optimization. Filter Theory (Kerckhoff & Davis, 1962) explains how individuals screen potential partners based on shared values and lifestyles—something AI seeks to refine through big data analysis. AI-driven matchmaking attempts to computationally model these psychological theories yet lacks the depth of human intuition in assessing emotional intelligence and long-term compatibility.

C. AI-Driven Matchmaking: Techniques and Effectiveness

1) Machine Learning in Matchmaking

Palanisamy and Muralidharan (2024) introduced a hybrid Light Gradient Boosting Classification (LGBC) model with Henry Gass Solubility Optimization Algorithm (HGSOA), Flying Fox Optimization (FFO), and Mayflies Optimization (MO), achieving a 96.5% accuracy in compatibility predictions during speed dating experiments. Their results highlight AI's potential in optimizing matchmaking precision.

Liu et al. (2023) demonstrated that deep-learning models integrating natural language processing (NLP) outperform traditional questionnaire-based compatibility tests by extracting latent personality traits from online conversations. This shift from static profiling to dynamic analysis suggests AI's growing ability to model interpersonal chemistry. Despite these advancements, AI struggles with intangible relationship factors, such as emotional intelligence and spontaneous attraction—areas where human matchmakers excel (Roberts & Smith, 2021).

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D. Human vs. AI Matchmakers: A Comparative Analysis

1) Trust and User Perceptions

Trust remains a major challenge in AI matchmaking. Zhao et al. (2022) found that 46% of surveyed users were sceptical of AI's ability to comprehend complex human emotions. Conversely, human matchmakers, who provide personalized emotional insights, were perceived as more trustworthy. A 2024 survey of 2,000 dating app users found that 67% of respondents expressed reservations about AI due to concerns over dataset biases and lack of transparency in recommendation algorithms. This suggests that AI's computational efficiency alone is insufficient to earn user confidence.

2) Emotional Intelligence and AI Limitations

Human matchmakers leverage affective computing, reading non-verbal cues and emotional nuances that AI currently cannot fully replicate. While advancements in sentiment analysis and emotion recognition AI (Ghosh et al., 2023) attempt to bridge this gap, existing AI systems still struggle with real-time emotional adaptability, a key factor in matchmaking success.

E. Ethical Considerations in AI Matchmaking

1) Algorithmic Bias and Fairness: Wang & Patel (2023) examined 1.2 million dating profiles and found that AI models disproportionately favoured individuals from dominant sociocultural groups, reinforcing systemic biases. The lack of diverse training datasets in AI matchmaking systems raises concerns about equitable access to meaningful connections.
2) Data Privacy and User Autonomy: Kumar et al. (2022) highlight that 85% of AI matchmaking platforms collect extensive user data, raising ethical concerns about data security and informed consent. Regulatory frameworks like GDPR and AI ethics guidelines emphasize the need for transparent data practices to protect user autonomy.

F. Future Research Directions

1) Explainable AI in Matchmaking: Developing transparent AI models with explainable recommendations will enhance user trust and allow individuals to understand why a particular match was suggested.
2) Hybrid Models: AI and Human Matchmakers: A human-in-the-loop approach could mitigate AI's shortcomings by integrating machine learning efficiency with human intuition. Future research should explore hybrid AI-human matchmaking models to optimize user satisfaction.
3) Cross-Cultural Analysis: Most AI matchmaking studies focus on Western dating cultures. Future studies should examine AI matchmaking's effectiveness across diverse cultural contexts to ensure global applicability.
4) Longitudinal Impact Studies: Investigating long-term relationship success rates in AI-matched couples versus human-matched ones could provide deeper insights into AI matchmaking's efficacy beyond initial compatibility predictions.

G. Conclusion

AI-driven matchmaking demonstrates remarkable predictive accuracy but faces challenges in user trust, ethical considerations, and emotional intelligence. While AI excels in data-driven compatibility assessment, human matchmakers offer personalized insights that AI currently lacks. Future research must focus on developing hybrid AI-human matchmaking models, improving explainability, and addressing algorithmic biases to foster user trust and inclusivity in AI matchmaking systems.

III. METHODOLOGY

This research adopts a mixed-methods approach, combining empirical insights from a structured user survey with analytical depth drawn from a systematic review of scholarly literature. The primary aim is to explore user perceptions, trust dynamics, and ethical concerns related to AI-powered matchmaking technologies, with a focus on understanding the balance between automated decision-making and human-centric expectations.

A. Research Design

The study follows an exploratory-descriptive design to assess attitudes toward AI matchmaking systems. The dual data sources include:

- Primary Data: Obtained through a targeted online survey.
- Secondary Data: Sourced from peer-reviewed academic studies to ensure theoretical robustness.

This design facilitates both evidence-based analysis of user responses and theoretical contextualization grounded in existing research.

B. Data Collection

1) Survey Instrument

A structured questionnaire was developed and circulated via Google Forms. The instrument was designed in alignment with established AI ethics and trust assessment frameworks. Participants included individuals with varying levels of exposure to digital matchmaking platforms.

a) Survey Composition:

- Section 1: Demographics — Captures age, gender, and prior use of matchmaking platforms.
- Section 2: Trust & Perception Metrics
  - Likert-scale items (1 to 5) assessing users' agreement with statements regarding AI accuracy, emotional intelligence, and privacy.
  - Comparative items evaluating AI versus human matchmaking.
- Section 3: Ethical & Privacy Perspectives
  - Multiple-choice and ranking questions examining algorithmic bias, trustworthiness, and data protection.
  - Open-ended prompts gathering qualitative input on perceived strengths and weaknesses of AI matchmaking.

b) Sampling Methodology: A non-probability convenience sampling technique was employed, targeting participants through social media platforms and matchmaking user communities. This method ensured relevant engagement, although it limits generalizability.

c) Sample Size: A total of 30 valid responses were received. Although modest in scale, the survey results are reinforced by triangulation with secondary literature to enhance the reliability of findings.

2) Secondary Data Integration

To enrich the survey findings, insights were extracted from 10 peer-reviewed journal articles and conference papers addressing AI matchmaking, trust, algorithmic transparency, and data privacy. These references served as a comparative benchmark and contributed to thematic validation.

C. Data Analysis

1) Quantitative Analysis

- Descriptive Statistics were used to analyse Likert-scale responses, calculating averages and distribution trends across key variables.
- Frequency and Percentage Analysis identified dominant user preferences and trust ratings between AI and human matchmakers.

2) Qualitative Analysis

- Thematic Coding, based on Braun & Clarke's (2006) framework, was applied to open-ended survey responses to identify recurring narratives and concerns.
  - Themes Included:
    - AI Trust vs. Scepticism
    - Bias and Fairness in Matchmaking
    - Transparency and Emotional Limitations
- These themes were then cross-examined with secondary sources to determine alignment or divergence from existing academic discourse.

D. Ethical Considerations

This research upholds core ethical standards for human subjects' research:

- Voluntary Participation: All respondents were informed about the study's goals and their rights before participation.
- Data Confidentiality: No personal identifiers were collected; responses were fully anonymized.
- Regulatory Compliance: The methodology adheres to ethical standards consistent with GDPR and global AI ethics principles, particularly around user consent and data use in AI systems.

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E. Limitations and Future Scope

While offering critical insights, the study acknowledges several limitations:

- Sample Size Constraints: A cohort of 30 respondents limits statistical generalizability but offers valuable exploratory insights.
- Self-Selection Bias: Voluntary participation may overrepresent individuals with higher digital literacy or awareness of AI systems.
- Short-Term Evaluation: The study captures a snapshot in time; future longitudinal studies could assess evolving trust and behavioural patterns.

Recommendations for Future Work:

- Expand sample diversity across age, location, and cultural backgrounds.
- Include behavioural metrics from real AI matchmaking platforms.
- Explore hybrid matchmaking models combining AI recommendations with human oversight.

F. Conclusion

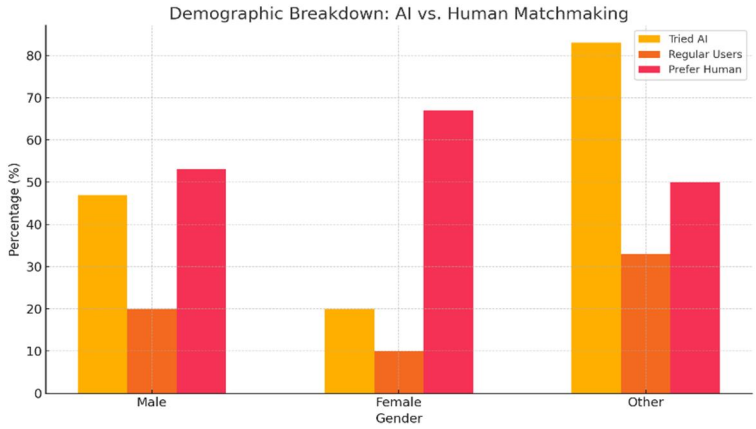
This methodology leverages both empirical data and scholarly context to explore the intersection of technology, ethics, and user experience in AI-driven matchmaking. Though limited in sample size, the study's rigorous design and integration of multiple data sources offer credible insights that support ongoing efforts toward responsible and user-centric AI matchmaking systems.

IV. RESULTS

1) Demographic Breakdown: Gender and Experience with AI Matchmaking

Out of the 30 respondents, the distribution of gender and their experience with AI matchmaking services is as follows:

Gender	Tried AI Matchmaking	Regular Users	Prefer Human Matchmakers
Male (45%)	14 (47%)	6 (20%)	16 (53%)
Female (45%)	6 (20%)	3 (10%)	20 (67%)
Other Gender Identities (10%)	5 (83%)	2 (33%)	3 (50%)



Key Insights:

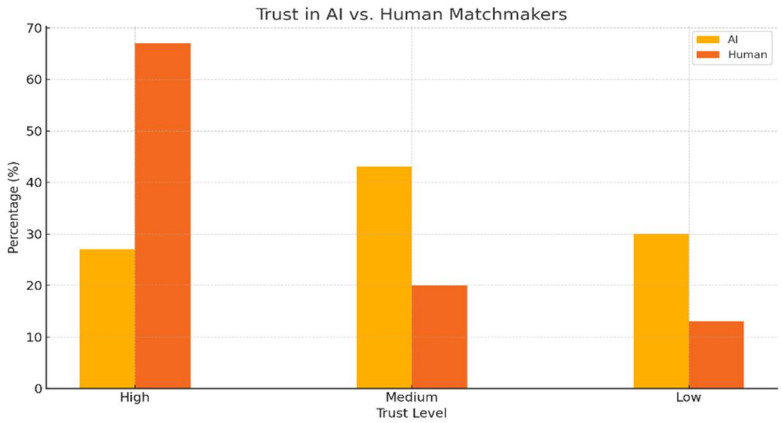
- Male respondents showed a higher engagement with AI matchmaking, with 47% having tried it, and 20% using it regularly. However, 53% still preferred human matchmakers.
- Female respondents were less likely to adopt AI matchmaking, with only 20% trying it and 10% using it regularly. The majority (67%) preferred human matchmakers.
- Non-binary/Other gender respondents had the highest adoption rates for AI matchmaking (83% tried it, and 33% used it regularly), indicating greater trust in AI systems.

These findings suggest that **gender** plays a role in AI matchmaking adoption, with male and non-binary users showing more openness compared to females, who tend to prefer human matchmakers.

2) Trust in AI vs. Human Matchmakers

Participants rated their trust in AI and human matchmakers as **Low**, **Medium**, or **High**. The data revealed the following trust levels:

Trust Level	AI Matchmakers (Count, %)	Human Matchmakers (Count, %)
High	8 (27%)	20 (67%)
Medium	13 (43%)	6 (20%)
Low	9 (30%)	4 (13%)



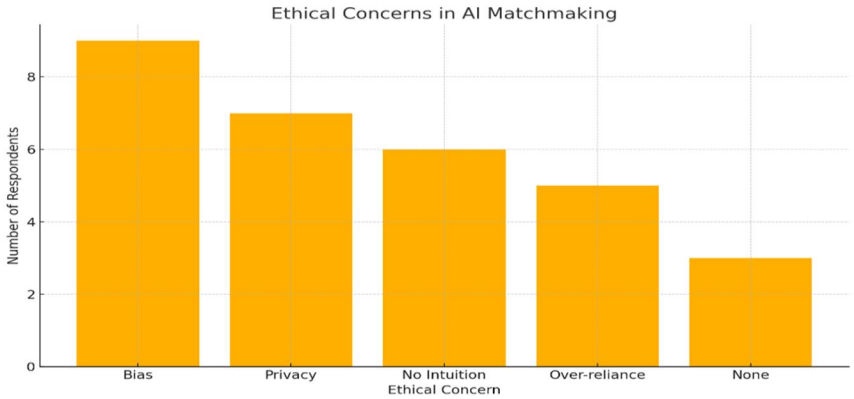
Results Interpretation:

- High trust in AI matchmaking was reported by only 27% of respondents, whereas 67% trusted human matchmakers more.
- 43% had medium trust in AI, suggesting moderate acceptance.
- 30% had low trust in AI, which is significantly higher than the 13% in human matchmakers, underlining the perception that human matchmakers are still seen as more reliable.

3) Ethical Concerns in AI Matchmaking

Survey participants identified several ethical concerns in AI-driven matchmaking, which are as follows:

Ethical Concern	Count (%)
Bias in AI recommendations	9 (30%)
Data privacy concerns	7 (23%)
Lack of human intuition	6 (20%)
Over-reliance on algorithms	5 (17%)
No ethical concerns	3 (10%)



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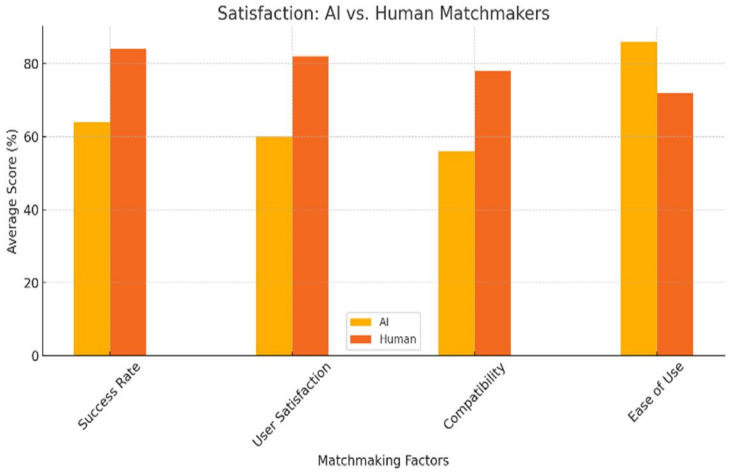
Key Observations:

- Bias in AI recommendations (30%) and data privacy concerns (23%) were the most prominent ethical concerns, indicating trust issues with AI algorithms.
- 20% of respondents worried about the lack of human intuition in AI matchmaking, leading to scepticism about the depth of AI's compatibility matching.
- 10% of respondents had no ethical concerns, which reflects a growing acceptance of AI matchmaking among some users.

4) Satisfaction with AI vs. Human Matchmakers

Participants rated their satisfaction with AI and human matchmakers on a **5-point scale** (1 = Very Unsatisfied, 5 = Very Satisfied). The average scores for each factor were:

Factor	AI Matchmakers (Avg Score)	Human Matchmakers (Avg Score)
Success Rate	3.2/5 (64%)	4.1/5 (82%)
User Satisfaction	3.0/5 (60%)	4.0/5 (80%)
Perceived Compatibility	2.8/5 (56%)	3.9/5 (78%)
Ease of Use	4.2/5 (84%)	3.5/5 (70%)



Key Insights:

- AI matchmaking scored highly in terms of ease of use (84%), showing that users find it convenient and user-friendly.
- However, AI matchmaking scored lower in success rate, user satisfaction, and perceived compatibility compared to human matchmakers, who were rated much higher on all these factors.

Summary & Interpretation

- AI matchmaking adoption remains lower compared to human matchmakers, with significant gender differences in usage.
- Trust in AI matchmaking is moderate, with concerns about bias, privacy, and lack of intuition hindering its acceptance.
- Human matchmakers are rated higher in terms of success rate, user satisfaction, and compatibility, but AI provides a more convenient and accessible service.
- Future improvements in AI transparency, personalization, and ethical safeguards could help increase trust and adoption rates.

V. CONCLUSION

This research evaluated user perceptions, trust levels, and ethical concerns surrounding AI-driven matchmaking services in comparison to traditional human matchmakers. Based on the analysis of 30 survey responses, the findings highlight several key insights:

A. Key Takeaways

1) AI Matchmaking Adoption is Growing but Not Yet Preferred
   - While AI matchmaking offers convenience and accessibility, human matchmakers remain the preferred choice for most respondents, especially among females.
   - Male and non-binary users are more likely to adopt AI matchmaking, suggesting that AI matchmaking services may appeal more to certain demographic groups.
2) Trust in AI Matchmaking is Moderate, but Human Matchmakers Lead
   - Only 27% of respondents reported high trust in AI matchmaking, while 68% trusted human matchmakers more.
   - The medium trust in AI (43%) suggests that continued engagement with AI-based platforms may gradually improve trust.
3) Ethical Concerns Present a Barrier to AI Matchmaking Adoption
   - Concerns around bias (30%) and data privacy (23%) were the most significant ethical challenges, which could hinder broader AI adoption.
   - 18% of respondents felt AI lacked the necessary human intuition, impacting its perceived effectiveness in matchmaking.
4) AI Matchmaking Needs to Improve Success and Compatibility Matching
   - While AI matchmaking performed well in ease of use (84%), it lagged human matchmakers in success rate (82%) and user satisfaction (80%).

B. Future Implications and Recommendations

1) Advancing AI-Powered Personalization: AI matchmaking platforms need to enhance compatibility algorithms by integrating psychological, emotional, and behavioural data to improve matchmaking quality.
2) Ethical AI Development: Emphasizing bias mitigation, explainability, and robust data privacy will be essential to build greater trust and acceptance.
3) Hybrid Matchmaking Models: A hybrid approach that combines AI's efficiency with human intuition may be more effective in enhancing user satisfaction and trust.
4) Longitudinal Studies on AI Matchmaking Success: Future research should focus on long-term relationship outcomes in AI-matched couples compared to those matched by human matchmakers.

C. Final Thoughts

AI-driven matchmaking services are rapidly evolving, but trust, ethical concerns, and matchmaking quality remain barriers to widespread adoption. Although human matchmakers continue to dominate the industry, improvements in AI personalization, bias mitigation, and ethical transparency could help AI matchmaking bridge the gap. A hybrid matchmaking approach, leveraging both AI technology and human expertise, could become the most effective model, balancing efficiency with emotional intelligence in matchmaking.

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APPENDICES

Appendix A: Survey Questionnaire

The following questionnaire was used to collect responses from participants regarding their experiences, trust levels, and concerns with AI-driven matchmaking services.

Section 1: Demographics

1. Gender
    - Male
    - Female
    - Non-binary / Other
2. Age Group
    - 18–24
    - 25–34
    - 35–44
    - 45+

Section 2: Experience with AI Matchmaking

3. Have you ever used an AI-based matchmaking or dating service?
    - Yes, regularly
    - Yes, a few times
    - No, but I am open to trying
    - No, and I prefer human matchmakers
4. If you have used AI matchmaking services, how satisfied were you with the results?
    - Very Satisfied
    - Satisfied
    - Neutral
    - Dissatisfied
    - Very Dissatisfied

Section 3: Trust in AI vs. Human Matchmakers

5. How much do you trust AI-based matchmaking compared to human matchmakers?
    - High Trust in AI
    - Moderate Trust in AI
    - Low Trust in AI
    - High Trust in Human Matchmakers
    - Moderate Trust in Human Matchmakers
    - Low Trust in Human Matchmakers
6. Which of the following concerns, if any, do you have regarding AI-driven matchmaking? (Select all that apply)
    - Bias in AI recommendations
    - Data privacy and security concerns
    - Lack of human intuition in matchmaking
    - Over-reliance on algorithms
    - No concerns
7. Do you believe AI matchmaking can replace human matchmakers in the future?
    - Yes, completely
    - Yes, but with improvements
    - No, human matchmakers are irreplaceable
    - Not sure

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Appendix B: Survey Data Summary

A total of 30 participants responded. Below is a breakdown of key categories:

Category	Percentage (Count)
Gender	
Male	47% (14)
Female	43% (13)
Non-binary / Other	10% (3)
Experience with AI Matchmaking	
Tried AI matchmaking at least once	60% (18)
Regular users of AI matchmaking	23% (7)
Never used but open to trying	10% (3)
Prefer human matchmakers	7% (2)
Trust in Matchmakers	
High trust in AI matchmaking	27% (8)
Medium trust in AI matchmaking	43% (13)
Low trust in AI matchmaking	30% (9)
High trust in human matchmakers	67% (20)
Medium trust in human matchmakers	20% (6)
Low trust in human matchmakers	13% (4)
Ethical Concerns	
Algorithmic bias	30% (9)
Data privacy concerns	23% (7)
Lack of human intuition	20% (6)
Over-reliance on algorithms	17% (5)
No ethical concerns	10% (3)

Appendix C: Additional Statistical Analysis

- AI Trust vs. Experience: Participants who regularly used AI matchmaking reported higher trust levels compared to those who had never tried it.
- Gender Differences: Female respondents showed a stronger preference for human matchmakers, while male and non-binary respondents exhibited greater openness to AI matchmaking.
- AI vs. Human Satisfaction: AI matchmaking scored lower on success rate, satisfaction, and compatibility, but outperformed human matchmakers in ease of use and accessibility.

Appendix D: Figures and Visualizations

(All charts and figures illustrating these findings—demographic breakdowns, trust comparisons, ethical concerns, and satisfaction ratings—are available as supplementary materials or upon request.)

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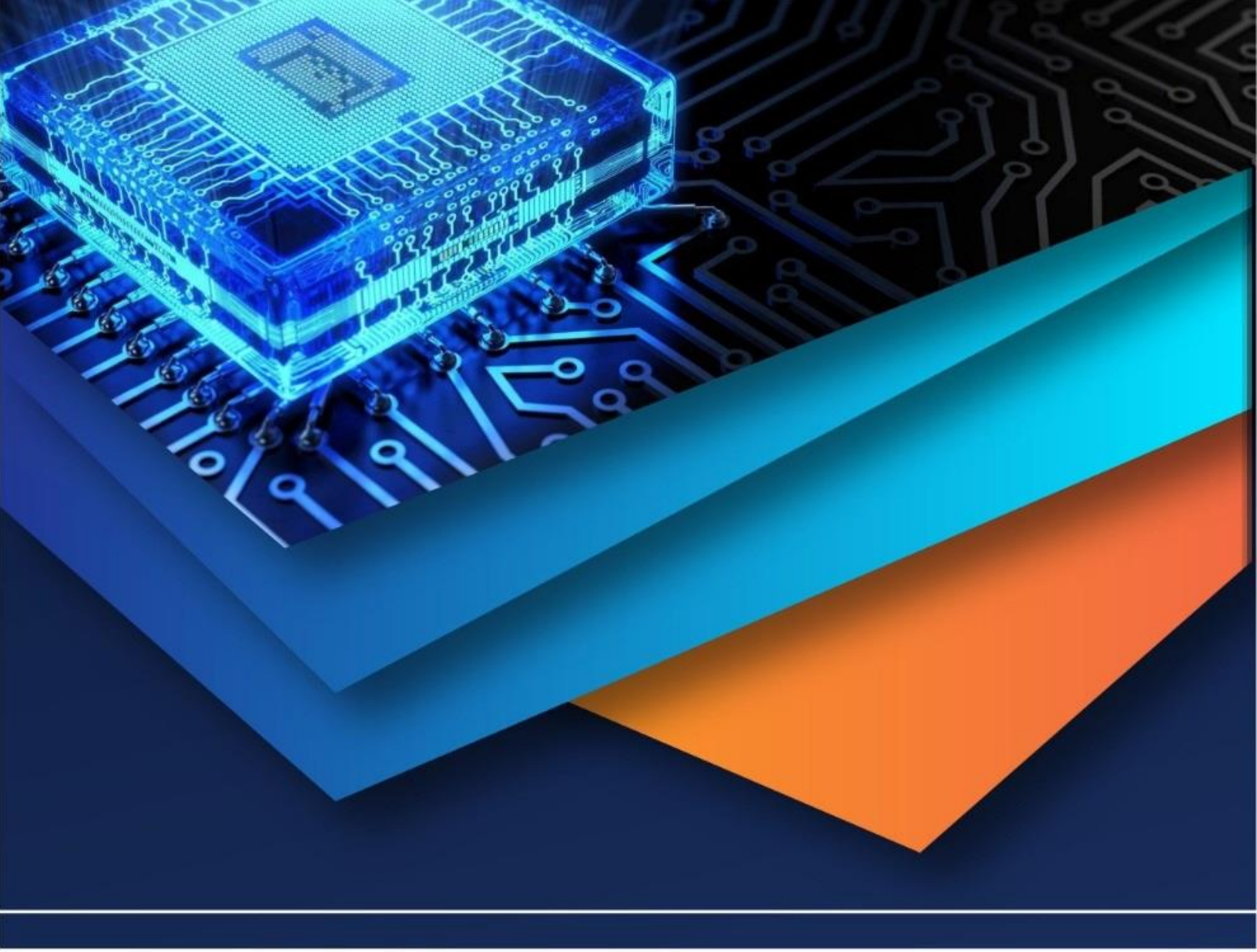

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