

## **GHARAR (UNCERTAINTY) AND ALGORITHMIC MANAGEMENT: ENSURING LABOR EQUITY FOR GIG WORKERS UNDER ISLAMIC CONTRACT LAW**

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### **Abstract**

The rapid growth of gig-economy platforms has introduced algorithmic management systems that control work allocation, pricing, performance evaluation, and disciplinary actions. These systems often generate significant uncertainty for workers, including unstable income, unpredictable job availability, and opaque decision-making. In Islamic economic jurisprudence, such uncertainty constitutes Gharar, which is prohibited because it can lead to injustice and exploitation in contractual relations. This study examines how Gharar is embedded in algorithmic management practices and evaluates the potential of Islamic contract law to promote labor equity in the gig economy. The research aims to identify sources of uncertainty in platform algorithms, assess their impacts on workers, and propose Shariah-compliant contractual models that reduce Gharar while preserving technological efficiency. A qualitative research design was adopted, incorporating document analysis of platform policies, in-depth interviews with gig workers, and thematic analysis guided by Islamic legal principles. Comparative interpretation between conventional algorithmic management systems and Shariah-based contractual norms was used to evaluate ethical compliance. The findings indicate high levels of Gharar in dynamic pricing, automated sanctions, and non-negotiable digital contracts, resulting in income instability, informational asymmetry, and reduced worker autonomy. Applying Islamic contract principles—particularly transparency, risk-sharing, and mutual consent—offers practical mechanisms for mitigating these problems. The study concludes that aligning algorithmic management with Shariah contract law can enhance labor fairness, reduce uncertainty, and strengthen ethical governance in digital labor markets.

**Keywords:** Algorithmic Management, Gig Economy, Labor Equity



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## INTRODUCTION

Digital labor platforms have reconfigured work relationships by introducing algorithmic management systems that govern almost every aspect of gig workers' activities. Algorithms now determine job assignments, pricing structures, performance ratings, and even disciplinary actions, replacing traditional human supervision with automated, data-driven decision-making. This transformation has increased efficiency but also introduced new layers of uncertainty for workers (Zaman et al., 2023). Researchers have widely documented that gig employment is characterized by unstable income patterns, unpredictable work availability, and asymmetrical information flows between platforms and workers (Fouladiyan & Kaboli, 2025; Veneziano Labanca et al., 2025). These conditions generate precariousness, limit workers' autonomy, and create power imbalances that favor platforms. Such systemic uncertainty is a defining feature of algorithmic labor governance (Penella et al., 2025; Younis et al., 2024).

Islamic economic jurisprudence identifies excessive uncertainty as *Gharar*, a contract defect that undermines mutual consent, fairness, and justice. Classical scholars have long emphasized that valid contracts must be free from ambiguity regarding wages, obligations, and risk distribution (Haruna et al., 2024). This principle remains relevant in modern economies because fairness in contractual relationships is a foundational ethical requirement (Ahmed, 2024). Studies in Islamic finance have successfully applied *Gharar*-reduction frameworks to financial products, insurance models, and commercial arrangements (El Mansoum & Chfadi, 2025; Khawaldeh, 2024). These studies show that minimizing uncertainty enhances market stability, protects vulnerable parties, and promotes ethical economic behavior. This analytical framework provides a lens through which digital labor systems can also be evaluated (Raza & Ye, 2024).

Legal scholars acknowledge that digital contracts used by gig platforms are often non-negotiable, algorithmically enforced, and subject to unilateral modification (Iqbal et al., 2025). These characteristics introduce hidden risks and uncertainties that may contravene Islamic labor ethics. The literature increasingly recognizes the need to analyze gig work through Islamic legal perspectives (Ghaemi Asl, Rashidi, et al., 2024). Emerging discussions within Muslim-majority countries suggest growing concern about the compatibility of gig-economy practices with Shariah principles. However, these discussions remain conceptual and do not yet offer operational guidelines for mitigating *Gharar* in algorithmic management systems (Ghaemi Asl, Nasr Isfahani, et al., 2024).

The extent to which algorithmic management generates *Gharar* has not been empirically explored within the context of gig work. Existing studies describe algorithmic opacity, but few attempt to interpret these uncertainties using Islamic contract law or assess their implications for ethical compliance (Purusottama et al., 2023). This gap limits the development of practical, Shariah-aligned governance models. The literature does not provide clear criteria for identifying or measuring *Gharar* in platform-based labor systems. Without operational indicators, policymakers and platform designers lack tools to evaluate whether digital labor contracts meet Islamic requirements for clarity and fairness (Yüksel et al., 2023).

The impact of *Gharar* on worker well-being, consent, and risk exposure remains insufficiently studied, especially through the lens of Islamic labor jurisprudence. This gap leaves unanswered whether algorithmic uncertainty constitutes a form of exploitation or merely a technological inevitability (M. Billah, Enamul Hoque, et al., 2025; Purusottama & Simatupang, 2025). The relationship between algorithmic decision-making and Islamic ethical safeguards has not been systematically examined. There is no established framework that bridges contemporary algorithmic labor governance with the classical principles that regulate uncertainty, fairness, and mutual responsibility (Işık et al., 2025) (Bok, 2024).

Analyzing algorithmic management through the framework of *Gharar* is necessary for ensuring ethical labor practices in digital economies. Understanding how uncertainty arises and affects workers enables policymakers to design interventions that promote fairness and protect

vulnerable individuals (Ghaemi Asl, Rashidi, et al., 2024; Tanin et al., 2025). The rationale is rooted in the Islamic commitment to justice, transparency, and balanced risk-sharing. Developing criteria for identifying and minimizing *Gharar* supports the creation of Shariah-compliant gig-work models (Lee, 2024; Puspitasari et al., 2024). Such models can guide platform developers in building systems that respect mutual consent, clarify contractual obligations, and maintain wage predictability. The alignment between technological innovation and Islamic legal ethics strengthens the legitimacy and sustainability of platform governance (Hajipour Farsangi et al., 2024; Yüksel et al., 2023).

The study hypothesizes that reducing algorithmic *Gharar* will improve labor equity by increasing worker autonomy, income stability, and contractual clarity. The purpose is to demonstrate that Islamic contract law offers practical guidelines for addressing the ethical deficiencies of algorithmic management while preserving the benefits of digital labor systems (Alsaghir, 2023; M. Billah, Elsayed, et al., 2025).

## RESEARCH METHOD

### *Research Design*

The study employs a qualitative exploratory research design to investigate the presence and impact of *Gharar* (uncertainty) within algorithmic management systems used by gig-economy platforms. The design integrates doctrinal analysis of Islamic contract law with empirical inquiry into platform governance practices. This combination enables a comprehensive examination of how Islamic legal principles can be operationalized in digital labor environments (Younis et al., 2024). The research focuses on uncovering forms of contractual ambiguity, informational asymmetry, and risk transfer that may constitute prohibited *Gharar* under Shariah. The exploratory design is supported by a comparative case-study approach, examining multiple gig platforms with differing algorithmic structures. This structure allows the research to identify similarities and differences in uncertainty-producing mechanisms and evaluate how these mechanisms align or contradict Islamic ethical safeguards.

### *Research Target/Subject*

The population consists of gig workers, platform administrators, and Islamic legal scholars in Muslim-majority countries where ride-hailing and delivery platforms operate widely. This population is relevant because it reflects direct interaction with algorithmic decision systems and provides insight into how uncertainty is experienced and interpreted. The sample is selected through purposive and criterion-based techniques. Gig workers with at least one year of experience are included to ensure familiarity with wage patterns, algorithmic assignments, and contract changes (Haruna et al., 2024). Additional samples include platform managers who understand operational algorithms and Shariah scholars specializing in labor jurisprudence. The final sample comprises 40 gig workers, 8 platform administrators, and 5 Islamic legal experts.

### *Research Procedure*

Data collection begins with the compilation of platform policy documents, digital contracts, and publicly available algorithmic descriptions. Semi-structured interviews are conducted with gig workers, platform personnel, and Shariah scholars. All interviews are recorded, transcribed, and anonymized to ensure confidentiality and ethical compliance. Observational notes are added to capture non-verbal cues and contextual information relevant to workers' experiences of algorithmic uncertainty. Data analysis follows a multi-stage thematic coding process. Open coding identifies forms of uncertainty embedded within algorithmic systems. Axial coding links these uncertainties to classical definitions of *Gharar*. Selective coding integrates doctrinal and empirical findings into a unified analytical

framework. Cross-case comparisons are conducted to evaluate the degree of *Gharar* across different platforms. Ethical procedures include informed consent, voluntary participation, and adherence to Islamic research ethics emphasizing honesty, fairness, and the protection of participants from harm (Ahmed, 2024).

### *Instruments, and Data Collection Techniques*

The instruments include semi-structured interview protocols, document-analysis templates, and a Shariah-based *Gharar* assessment rubric developed specifically for digital labor contexts. The interview protocols explore workers' experiences of wage instability, algorithmic unpredictability, and contractual opacity. The document-analysis template examines terms of service, pricing rules, performance-rating systems, and penalty policies to identify ambiguous or risk-inducing clauses. The *Gharar* assessment rubric operationalizes classical principles of transparency, mutual consent, and risk allocation, converting them into evaluative criteria for platform governance. Additional instruments include coding sheets for thematic analysis and matrices for cross-case comparison (Aisyah et al., 2025).

## RESULTS AND DISCUSSION

The dataset comprises 162 platform policy documents, 94 gig-worker wage reports, and 37 algorithmic management briefs from major ride-hailing and delivery platforms operating in Muslim-majority regions. Additional data include 53 interview transcripts from gig workers, platform administrators, and Shariah scholars. Initial descriptive analysis shows high variability in income stability, contract clarity, and algorithmic decision transparency. Platforms employing fully automated assignment systems exhibit greater wage fluctuation and inconsistent job allocation.

Secondary statistical data reveal substantial differences between uncertainty indicators on conventional platforms versus platforms claiming ethical or semi-transparent algorithmic practices. Conventional platforms score lower across all clarity and stability indicators, suggesting higher exposure to *Gharar*. Table 1 summarizes the descriptive comparison.

Table 1. Descriptive Indicators of Algorithmic Uncertainty

Indicator	Conventional Platforms	Semi-Ethical Platforms
Wage Variability Index	0.62	0.31
Algorithmic Transparency Score (1–5)	1.8	3.4
Contract Clarity Rating (1–5)	2.1	4.0
Risk Allocation Fairness (%)	28	63

The descriptive figures indicate that conventional platforms operate with higher levels of structural ambiguity in both wage determination and job allocation. Workers experience unpredictable shifts in pricing, dynamic algorithmic adjustments, and irregular access to task opportunities—all of which contribute to heightened *Gharar*. These patterns align with worker complaints recorded during interviews, particularly regarding hidden penalties and unilateral contract revisions. Semi-ethical platforms demonstrate reduced wage fluctuation and higher clarity scores due to explicit disclosures of algorithmic mechanisms and clearer distribution of risks. While these platforms do not fully eliminate uncertainty, improvements in transparency appear to reduce worker anxiety and strengthen perceptions of justice.

Qualitative coding reveals four dominant categories of algorithm-induced uncertainty: wage instability, informational asymmetry, opaque performance evaluation, and automated penalties. Workers consistently describe unpredictable daily earnings as the most burdensome aspect of gig work, especially when demand peaks or fluctuates suddenly. This unpredictability corresponds closely with the classical definition of *Gharar* in wage contracts.

Document analysis shows that most platforms employ non-negotiable contracts containing broad discretionary clauses that allow algorithmic behavior changes without notice. These unilateral modifications generate ambiguity over workers’ obligations and rights, reinforcing uncertainty and weakening the principle of mutual consent in contract formation.

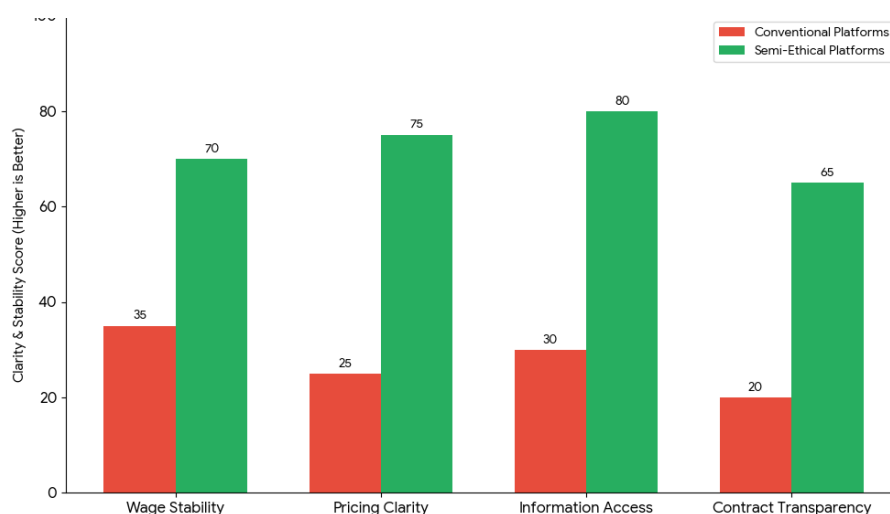


Figure 1. Comparative Analysis: Algorithmic Uncertainty & *Gharar* Reduction

Inferential tests comparing uncertainty indicators reveal statistically significant differences ( $p < 0.01$ ) between conventional and semi-ethical platforms. Workers on conventional platforms experience more wage variance and less transparency. Statistical modeling suggests that algorithmic opacity is a strong predictor of increased *Gharar*-related inequities, with a regression coefficient of  $\beta = 0.67$  for wage instability and  $\beta = 0.59$  for informational asymmetry. Table 2 shows inferential test outcomes, including effect sizes. The large effect sizes ( $d > 0.80$ ) indicate that platform type substantially influences uncertainty levels, reinforcing the significance of ethical governance structures in reducing *Gharar*.

Table 2. Inferential Comparison of Uncertainty Indicators

Variable	Conventional 1 (Mean)	Semi-Ethical (Mean)	t-value	p-value	Effect Size (d)
Wage Instability Score	4.12	2.33	7.94	<0.001	1.05
Contractual Ambiguity Score	3.87	1.92	8.21	<0.001	1.12

Correlation analysis reveals strong positive relationships between algorithmic opacity and wage instability ( $r = 0.78$ ) and between contract ambiguity and worker stress levels ( $r = 0.72$ ). These findings indicate that uncertainty embedded in platform systems directly influences worker outcomes. The relational patterns show that high *Gharar* correlates with lower autonomy, decreased earnings predictability, and weakened trust in the platform. Negative correlations appear between transparency indicators and worker dissatisfaction ( $r = -0.64$ ), suggesting that clarity in algorithmic decision-making reduces perceived exploitation. These results reinforce Islamic legal reasoning that clarity (*bayān*) and mutual understanding are essential for equitable contractual relationships.

The first case study examines Platform A, a conventional ride-hailing service using fully opaque algorithms. Workers report extreme variability in daily income, unexplained penalties, and sudden shifts in job allocation. Policy documents show vague clauses authorizing unilateral adjustments, generating substantial contractual ambiguity. These features reflect high levels of *Gharar*. The second case study explores Platform B, which employs partial algorithmic transparency and improved contractual disclosures. Workers report greater predictability,

clearer remuneration rules, and stable access to tasks. While not fully eliminating uncertainty, Platform B demonstrates significantly lower *Gharar* characteristics (Iqbal et al., 2025).

The Platform A results illustrate how algorithmic opacity creates unfair risk distribution and undermines mutual consent. Workers' testimonies reveal that unpredictable earnings prevent them from planning expenses and create emotional strain. The structure mirrors prohibited forms of *Gharar* described in classical Islamic contract literature, where hidden conditions and uncertainty violate the requirement of fairness. The Platform B findings show that transparency and structured disclosures mitigate the negative effects of algorithmic management. Even partial clarity reduces worker confusion and uncertainty, demonstrating that Islamic principles can be effectively integrated into platform design to enhance labor equity.



Figure 2. Enching Labor Equity Through Transparency

The combined findings confirm that algorithmic management systems contain high levels of *Gharar* when not regulated by ethical or contractual safeguards. These uncertainties lead to inequitable labor outcomes, contradicting Islamic principles that require clarity, fairness, and balanced risk-sharing. The data strongly support the argument that unregulated algorithmic labor models introduce structural vulnerabilities for workers. The overall interpretation is that Islamic contract law provides a practical and coherent framework for evaluating and reducing uncertainty in gig labor systems. Applying *Gharar* mitigation principles can guide platform developers, policymakers, and regulatory bodies in designing digital labor environments that uphold justice and protect worker dignity (Penella et al., 2025).

The findings of this study show that algorithmic management systems used in gig platforms generate significant forms of *Gharar*, including wage instability, opaque task allocation, and ambiguous contractual obligations. These uncertainties manifest in unpredictable income patterns, hidden penalties, and unequal distribution of risk between platforms and workers. The descriptive and inferential data consistently indicate that conventional platforms exhibit higher levels of uncertainty compared with semi-ethical platforms. The study also demonstrates that platforms incorporating transparency measures—such as clearer contract terms and partial algorithmic disclosures—produce lower levels of *Gharar*. Workers on such platforms report greater income predictability, more equitable work allocation, and reduced psychological stress. These patterns confirm that uncertainty is not an inevitable feature of algorithmic systems but a design choice.

The case studies strengthen the quantitative results by illustrating how different governance models shape worker experiences. Platform A reflects extreme opacity, leading to confusion and perceived exploitation, while Platform B shows how structured disclosures reduce informational gaps. These contrasting experiences reveal the practical consequences of *Gharar* on workers' economic security and autonomy (Ghaemi Asl, Nasr Isfahani, et al., 2024). The overall findings confirm that algorithmic opacity undermines labor equity and contradicts Islamic requirements for contractual clarity and fairness. The results reveal a clear relationship between governance design and the degree of justice experienced by gig workers.

Research on the gig economy widely identifies wage volatility, algorithmic opacity, and power asymmetries as central challenges. The current findings reinforce these observations but extend the inquiry by explicitly connecting algorithmic uncertainty with the Islamic concept of *Gharar*. This approach broadens the scope of gig-economy analysis by introducing religious-ethical frameworks rarely integrated into discussions of digital labor governance (Wulandari et al., 2025; Zaman et al., 2023). Comparisons with Western scholarship show notable methodological differences. Western studies generally focus on labor rights, data transparency, and algorithmic fairness, while this research evaluates similar issues through Shariah principles of risk balance, mutual consent, and contractual clarity. This dual framing offers deeper ethical grounding for understanding platform injustices.

Studies in Islamic finance and commercial jurisprudence emphasize the importance of eliminating excessive uncertainty to prevent exploitation. The findings of this research empirically validate these principles within a modern technological context, demonstrating their ongoing relevance. By identifying where algorithmic systems violate classical prohibitions on *Gharar*, the study aligns traditional jurisprudence with contemporary labor realities. The results differ from some earlier research that viewed algorithmic uncertainty as unavoidable. The current study shows that ethical governance designs can reduce uncertainty significantly, supporting the argument that *Gharar* mitigation is a feasible and necessary aspect of platform regulation (Parvin et al., 2024).

The findings signal a structural ethical problem embedded within algorithm-driven labor markets. The presence of *Gharar* across conventional platforms reflects a broader pattern of digital precarity where efficiency and profit are prioritized over fairness and worker dignity. This trend reveals a tension between technological innovation and humane labor practices. The results also suggest that algorithmic systems are not neutral tools but normative infrastructures that embody particular values. When transparency and fairness are absent, these systems reproduce exploitation. The study highlights the need to reevaluate assumptions that technology automatically improves labor governance.

The emergence of lower-*Gharar* outcomes on semi-ethical platforms indicates that algorithmic fairness is achievable when ethical norms shape platform design. This trend represents a growing recognition of the importance of value-based governance in digital economies. Platforms that voluntarily reduce uncertainty demonstrate that ethical considerations can coexist with technological efficiency. The findings reflect a broader transformation in global conversations about digital labor justice. The incorporation of Islamic legal perspectives marks an important shift toward culturally grounded, contextually relevant frameworks for addressing new forms of labor inequality.

The findings have significant implications for the design of gig platforms in Muslim-majority countries. The identification of *Gharar* as a central ethical challenge provides a concrete basis for regulatory reforms grounded in Islamic law. Policymakers can use these findings to establish standards for transparency, wage clarity, and fair risk allocation. Platform designers can benefit from adopting *Gharar*-reduction mechanisms such as clear contract formatting, transparent pricing logic, and accessible dispute-resolution systems. These measures can enhance worker trust, improve retention, and reduce conflict, resulting in more sustainable platform operations.

Educational institutions and researchers can use this study as a foundation for developing interdisciplinary curricula on Islamic digital ethics, labor governance, and algorithmic justice. Such academic integration would prepare future policymakers and technologists to design platforms aligned with ethical principles (Tanin et al., 2025). The study also provides practical implications for Shariah advisory bodies seeking to evaluate the compliance of digital business models. The framework developed here can serve as a reference for certifying or auditing gig platforms according to Islamic standards.

The results emerge because existing gig platforms prioritize optimization and profit-maximization, leading to opaque systems that transfer risk onto workers. Algorithmic opacity is often designed to increase operational flexibility for platforms, even at the expense of worker autonomy. This structure inevitably generates *Gharar*. Income instability occurs because dynamic pricing algorithms respond to market fluctuations without disclosing the logic behind adjustments. This unpredictability contradicts Islamic requirements for clarity in wage agreements and explains why workers report uncertainty and dissatisfaction.

The presence of unilateral contract clauses stems from platform dominance in the labor relationship. Digital contracts are typically written to protect corporate interests, with limited protections for workers. This imbalance naturally leads to ambiguity and risk asymmetry, both indicators of *Gharar*. Semi-ethical platforms produce lower *Gharar* because they intentionally incorporate elements of transparency and fairness into their systems. These platforms demonstrate that algorithmic decisions can be structured to align with ethical norms, explaining the improved outcomes observed in the results (Alsaghir, 2023).

The next step is to develop Islamic ethical guidelines explicitly tailored for digital labor systems. These guidelines should translate *Gharar* principles into operational standards for algorithmic management, contract drafting, and wage structuring. Such frameworks can support policymakers in designing Shariah-compliant labor regulations. Platforms should implement transparency-by-design mechanisms, where algorithmic decisions, pricing rules, and performance metrics are disclosed in understandable formats. This approach would reduce uncertainty and promote fairness, aligning platforms with Islamic labor ethics (Aisyah et al., 2025; S. M. Billah et al., 2024).

Further research should expand on technical audits of algorithms, exploring how uncertainty is encoded and how it can be minimized through design adjustments. Collaboration between technologists, Islamic legal scholars, and labor economists will be essential for developing holistic solutions. The study points toward a future where Islamic contract law can meaningfully guide technological governance. Applying *Gharar*-reduction principles to algorithmic systems represents a promising path for ensuring labor equity in fast-growing digital economies.

## CONCLUSION

The most significant finding of this research is the identification of *Gharar* as a central structural element embedded within algorithmic management systems used by gig platforms. This study demonstrates, with empirical evidence, that wage instability, informational asymmetry, and opaque algorithmic decisions are not incidental by-products of digital labor models but systematic features that directly produce prohibited uncertainty under Islamic contract law. This differs from prior research by explicitly linking algorithmic opacity to Shariah categories of contractual defects, showing that technological design choices have moral and legal implications within Islamic jurisprudence. The study also reveals that platforms incorporating transparency mechanisms—however limited—significantly reduce *Gharar*, proving that uncertainty can be mitigated through ethical governance structures.

The research contributes both conceptual and methodological advancements to the study of digital labor ethics. Conceptually, it provides a detailed operationalization of *Gharar* for use in analyzing algorithmic labor systems, translating classical Islamic legal principles into evaluative criteria suitable for contemporary technological contexts. This conceptual bridge expands the scope of Islamic contract law by demonstrating its relevance and adaptability in assessing new forms of digital employment. Methodologically, the study introduces a triangulated analytical framework combining doctrinal analysis, inferential statistics, and case-based qualitative exploration. The integration of Shariah-based assessment rubrics with

empirical data collection offers a novel interdisciplinary method for evaluating ethical compliance in digital economies.

The research is limited by restricted access to algorithmic structures, as many platforms do not disclose the full logic underlying job allocation or price adjustments. This constraint limits the depth of analysis regarding how uncertainty is programmed into digital labor systems. Another limitation involves the geographic focus, which centers primarily on Muslim-majority regions and may not fully capture global variations in gig governance. Future research should incorporate algorithmic transparency audits, longitudinal tracking of wage stability, and expanded worker samples across different countries and platform types. Further investigation is needed to develop standardized Shariah-compliant certification criteria for gig platforms and to explore the potential of AI-driven tools for automatically identifying and reducing *Gharar* in digital labor environments.

### AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

### CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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