

Study on the Impact of Ethical Algorithms on the Value Orientation of Gig Workers

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Abstract: At present, the gig economy with algorithm as the core management method has become an important part of the global labor market. However, the early algorithm design with the sole goal of maximizing efficiency poses a significant threat to the professional dignity, job satisfaction and mental health of gig workers due to its "black box" operation, potential prejudice and exploitation, and pushes its value orientation to pure instrumentality and survivalism. This paper focuses on the emerging paradigm of "ethical algorithms" and explores how it profoundly affects and guides the value orientation of gig workers. Based on the self-determination theory, this paper deeply analyzes the three core mechanisms of ethical algorithms affecting the value orientation of gig workers: First, the transparency and interpretability of the algorithm drive the value orientation from survival anxiety to professional excellence by satisfying the "competency" needs of workers; secondly, the fairness and impartiality of the algorithm repairs the trust of the platform and cultivates the sense of professional belonging and community identity by meeting the "relationship" needs of workers. Third, the accountability of the algorithm and the autonomy granted by the algorithm make it change from a passive "digital Taylorism" executor to a professional with initiative by satisfying the "sense of autonomy" needs of workers. Therefore, ethical algorithm is not only an ethical revision of platform technology, but also a key driving force to guide the gig economy to a more equitable, sustainable and humanized future. It can promote the value orientation of gig workers from a single pursuit of economic benefits to a diversified direction that pays more attention to career growth, identity and social value. The research value of this paper lies in that, against the backdrop of increasingly stringent global regulation on algorithm governance, it provides a theoretical perspective for understanding how ethical choices in algorithm design shape workers' subjective value world, and also offers practical and feasible references for platform enterprises to balance social responsibilities while pursuing commercial goals and achieve sustainable development.

Keywords: Ethical algorithms; Gig economy; Value orientation; Self-determination theory; Algorithmic governance

1. Introduction

1.1 Research background: The new normal of the gig economy in the algorithmic era

The Gig Economy has become a stable and continuously expanding segment of the global labor market. From ride-hailing and food delivery to online design and remote consulting, hundreds of millions of workers rely on digital platforms to earn their income [1]. Initially hailed as a model for enhancing efficiency and optimizing resource allocation, this model promised unprecedented flexibility and autonomy to workers.

However, as the model matured, the shortcomings of purely efficiency-driven algorithmic design became increasingly apparent. Workers widely report being trapped within an opaque "algorithmic black box", unable to understand the logic governing task allocation, income fluctuations, or reward-and-penalty decisions [2]. This informational asymmetry produces a severe power imbalance: platforms exercise invisible, around-the-clock, fine-grained control through algorithms, systematically eroding worker autonomy. More seriously, algorithms may entrench and amplify social biases, resulting in discriminatory task distribution or income inequality—a digital Matthew Effect in which the advantaged grow progressively more advantaged [3]. Collectively, these dynamics reduce gig workers to quantifiable, interchangeable data points within the system, relegating their dignity, professional development, and psychological well-being to secondary concerns.

Beyond immediate psychological harm, the long-term career trajectories of workers under

algorithmic management are severely constrained by the short-sighted logic of platform design. Platform algorithms tend to lock workers into their current task roles, providing neither pathways for skill development nor incentives for lateral career progression. Research suggests that many full-time gig workers, after years on a platform, not only fail to accumulate meaningful professional skills but face heightened re-employment barriers upon leaving, having spent extended periods detached from traditional labour markets. This structural predicament further consolidates their instrumental value orientation, reducing work to the sole purpose of income generation and basic subsistence.

1.2 Problem statement: From the "algorithmic dilemma" to an "ethical solution"

Faced with the "algorithmic dilemma", policymakers, scholars, and the public worldwide have begun advocating for ethical regulation of algorithms. A landmark event was the successive enactment and implementation of the EU's Artificial Intelligence Act and the Platform Work Directive. By 2026, the key provisions of these regulations had fully taken effect, requiring algorithmic systems used for employment and worker management to meet stringent standards of transparency, fairness, traceability, and human oversight. This regulatory wave has spurred the emergence and development of "ethical algorithms," which no longer prioritize efficiency as the sole metric but instead integrate ethical principles such as fairness, transparency, accountability, and respect for human dignity throughout the entire process of algorithm design, deployment, and iteration [4].

This transformation raises the central question of this study: When gig platforms shift from efficiency-driven "control algorithms" to "ethical algorithms", what impact does this have on the value orientations of gig workers within these systems? Under traditional algorithmic management models, will the "game-theoretic" mindset and "survival-oriented" attitudes cultivated among workers evolve with the ethical transition of algorithms? Can ethical algorithms help gig workers regain professional identity and pursue higher-level career values? Understanding this mechanism is crucial not only for the well-being of hundreds of millions of gig workers but also for determining the future social value and sustainability of the gig economy model. Using self-determination theory as an analytical framework, this paper systematically elucidates the underlying logic by which ethical algorithms reshape workers' value orientations through addressing their fundamental psychological needs, while proposing corresponding design principles and practical pathways to provide platform operators, regulators, and policymakers with a theoretical foundation that balances efficiency with humanistic considerations.

2. Efficiency first: The negative influence of traditional algorithms on value orientation

Before examining the positive role of ethical algorithms, it is essential to first analyze how traditional efficiency-first algorithms systematically suppress gig workers' higher-level value pursuits. This analysis provides a reference framework for understanding the necessity and profound significance of the ethical shift, ensuring that gig workers not only feel frustrated by algorithmic decision outcomes but also develop distrust or even aversion toward them.

2.1 "Black Box" operations and erosion of trust

The core logic of most traditional platform algorithms is treated as a commercial secret, with their opacity consistently ranked among workers' most common grievances. When workers cannot understand why their earnings have declined, why they are not receiving desirable orders, or why their accounts have been downgraded, they develop strong feelings of unfairness and manipulation. This informational disadvantage makes it practically impossible for workers to engage in meaningful dialogue or negotiation with the platform; any appeal is liable to be dismissed by an unaccountable "system determination". Over time, workers' trust in the platform is severely eroded [5]. Rather than viewing the platform as a collaborative partner, workers come to perceive it as a cold, unpredictable, and adversarial "digital overseer".

The resulting atmosphere of suspicion and antagonism destroys the very foundation upon which relational and identity-based value orientations could be built—namely, trust. Moreover, this crisis of trust tends to radiate outward, shaping workers' broader perception of the entire digital economy. Some workers respond by actively reducing their engagement with the platform or adopting multi-platform strategies to distribute risk, rather than cultivating depth and professional reputation within a single platform. This defensive posture not only narrows workers' horizons to short-term income maximisation but fundamentally blocks the internal motivational drives required to pursue higher-order professional

values.

2.2 Refined control and deprivation of autonomy

Although flexibility is the gig economy's primary selling point, algorithmic management imposes powerful behavioural constraints through an array of fine-grained mechanisms—including acceptance rate requirements, peak-hour bonuses, and covert penalty systems. Workers appear to enjoy freedom of choice, yet to secure higher earnings or avoid sanctions they are compelled to follow algorithmic directives: working extended hours, operating in adverse weather, and accepting unreasonable orders. This form of "soft control" effectively strips work of its autonomy, leaving workers feeling like puppets manipulated by invisible algorithmic strings.

2.3 Quantitative performance and occupational alienation

Algorithms define and measure every dimension of workers' labour through data: order completion time, customer ratings, online duration, cancellation rates, and more. This extreme quantification causes the process value of work to be overlooked, reducing richly human service interactions to cold numerical metrics. In order to maintain high scores, workers may over-accommodate customers, suppress their authentic emotions, or capitulate to unreasonable demands—giving rise to serious occupational alienation and emotional exhaustion. Work is no longer a site for creativity or professional expression; instead, it becomes a "score-maximisation game" structured entirely around Key Performance Indicators (KPIs), with value orientation firmly locked at the instrumental level.

Over time, workers progressively lose their sense of meaning in work (meaning of work). Not only does this damage occupational identity, but it also precipitates emotional depletion and chronic burnout. Research has found that annual turnover rates among food delivery riders and comparable gig worker groups substantially exceed those in traditional service industries—a pattern that reflects the systematic erosion of workers' intrinsic sense of worth by quantified performance regimes. This vicious cycle—in which workers leave due to a lack of meaning, are replaced by new recruits subjected to the same quantified control, and depart in turn—ultimately undermines the long-term service quality of the platform and the broader social sustainability of the gig economy model.

3. Ethical reshaping: The internal mechanism of value orientation transformation

Ethical algorithms systematically address the aforementioned dilemmas through their core characteristics. Self-Determination Theory (SDT) posits that humans possess three innate psychological needs: autonomy, competence, and connection. When these needs are fulfilled, individuals' motivation shifts from external control to intrinsic drive, leading to enhanced creativity, well-being, and sustained engagement. Research applying SDT in workplace contexts demonstrates that environments supporting employees' fundamental psychological needs not only improve job engagement and performance but also profoundly shape their understanding of work meaning and professional value. Integrating SDT into algorithmic management analysis offers significant theoretical innovation: it establishes a bridge connecting technological design choices with workers' subjective value systems, revealing that algorithms serve not merely as efficiency tools but as an invisible force shaping workers' psychological experiences and value orientations. The principles of ethical algorithms precisely correspond to and satisfy these three fundamental needs.

3.1 Transparency and explainability → fulfill "sense of competence" → activate "autonomy-development orientation"

Competence refers to the belief that one has the capacity to meet environmental challenges and achieve intended outcomes. Within opaque algorithmic systems, workers' efforts appear to have unpredictable consequences, fundamentally undermining their sense of competence. The psychological concept of "learned helplessness" offers important explanatory power here: when individuals repeatedly experience an absence of predictable connections between their actions and outcomes, they progressively abandon attempts at active control and adopt passive, disengaged coping strategies. This is precisely one of the psychological harms inflicted by the traditional algorithmic black box—rather than motivating workers to perform better, it causes them to lose confidence in their own efforts.

The principles of transparency and explainability in ethical algorithms serve to "clear the fog". When

platforms disclose their task assignment rules, evaluation criteria, and revenue calculation methods, workers gain clear guidelines for action that link their efforts to tangible outcomes. This predictability and control enable workers to feel more competent in their roles, significantly enhancing their sense of competence.

A worker with a strong sense of competence undergoes a cognitive shift from passively "managing the system" to actively "mastering the craft", beginning to reflect on how to optimise their work strategies and improve service quality in order to achieve better evaluations. This naturally catalyses a pursuit of skill development and professional growth, steering value orientation away from basic survival imperatives and toward an autonomy-development orientation. This shift is supported by empirical evidence: research has found that when platforms present workers with clear visual performance feedback and improvement suggestions, service ratings, active engagement time, and platform retention rates all improve significantly. This indicates that the competence gains produced by transparency do not merely shape workers' subjective evaluations; they translate into concrete, positive behavioural change, generating a productive synergy between individual growth and platform development.

3.2 Fairness and impartiality → fulfilling the "sense of connection" → cultivating a "relationship-based identity orientation"

Relatedness refers to the need to feel connected to others and to one's community—to be genuinely cared for and respected. In the gig economy, this need faces a distinctive structural challenge: because gig workers are typically classified as independent contractors rather than employees, they lack the organisational belonging, collegial bonds, and professional community support that traditional employment relationships provide. This structural isolation means that the satisfaction of relatedness depends almost entirely on the quality of interactions between the platform and its workers. Under traditional algorithmic management, however, this need is routinely and severely undermined. Algorithms' latent biases and perceived unfairness lead workers to feel treated as disposable instruments rather than valued contributors.

Ethical algorithms prioritize fairness at their core. Whether it pertains to distribution fairness, procedural fairness, or interaction fairness, they aim to send workers a clear signal: you are a respected and equal partner. When workers perceive the algorithm as fair, their dissatisfaction and distrust toward the platform significantly decrease.

This trust rooted in fairness forms the foundation for establishing a positive psychological contract. Workers become more willing to adhere to platform rules and contribute to maintaining the healthy development of the platform ecosystem. They begin to see themselves as members of the platform community rather than mere isolated individuals. Professional identities (such as "Five-Star Food Delivery Rider") cease to be mere labels for earning money and instead evolve into proud, recognized social identities. Consequently, workers' pursuit of value in their work transcends the economic level, elevating to a "relationship-identity-oriented" pursuit of belonging, recognition, and collective honor. Notably, this reconstruction of identity carries significant social spillover benefits. When workers engage in social interactions with positive professional identities, their self-perception of social status improves, helping address the long-standing issue of "laborer visibility deficiency" in the gig economy. Research indicates that gig workers who perceive algorithmic fairness are more inclined to recommend the platform to others, actively participate in platform community discussions, and exhibit stronger organisational citizenship behaviours—all external expressions of a deeply internalised relational-identity orientation.

3.3 Accountability and autonomy → fulfilling the "sense of autonomy" → strengthening the "autonomy-development-oriented" and "relational-identity-oriented" approaches

A sense of autonomy refers to an individual's perception that their actions stem from personal will and enable self-regulation. It constitutes the core of intrinsic motivation and represents the psychological need dimension with the most profound impact on human behavioral dynamics within the SDT theoretical framework. Research indicates that when workers experience strong autonomy, their job engagement, creativity, and positive emotional evaluations of work significantly improve; conversely, the deprivation of autonomy directly reinforces extrinsic motivation, reducing work to a purely economic transaction. Traditional algorithms, through pervasive monitoring and directives, subject every aspect of work to precise quantitative control, severely suppressing employees' sense of autonomy and confining them to a motivational state entirely dependent on external rewards and punishments.

Ethical algorithms address this need by establishing accountability structures and expanding workers' scope of choice. Accountability mechanisms—particularly effective human appeal and intervention channels—give workers a genuine "voice". When workers can participate in the modification of rules rather than simply receiving them, their sense of control and autonomy is substantially enhanced. Expanded autonomy is also embedded in the fine details of algorithmic design: for example, platforms can offer greater task preference settings and allow workers to select orders from a wider range. The semi-transparent driver dashboard piloted by Uber in the Netherlands represents one such initiative, aimed at improving driver satisfaction and autonomy through greater informational symmetry.

When autonomy is fulfilled, workers experience greater enjoyment and intrinsic When autonomy is fulfilled, workers experience greater intrinsic enjoyment and satisfaction in their work, and are more likely to perceive work as an expression of self-actualisation. This not only reinforces their autonomy-development orientation toward higher professional standards, but also makes the platform itself—as an institution that grants voice and choice—more trustworthy, thereby consolidating a respect-based relational-identity orientation. In sum, the combined action of accountability and autonomy produces a fundamental identity shift in workers' subjective experience: from "tool-person" passively driven by algorithmic commands, to "agent" making professional judgements and value choices within the framework the algorithm provides. Work motivation correspondingly transforms from a defensive posture of avoiding punishment to a proactive orientation toward creating value—a shift that represents the most profound dimension of ethical algorithms' influence on gig workers' value orientations, touching not merely on behavioural adjustments but on the fundamental reconstruction of workers' self-conception and sense of occupational meaning.

4. Design principles and practical approaches for ethical algorithms

Translating ethical algorithms from theoretical concepts into reality requires coordinated efforts from platforms, technology developers, and regulatory authorities. This collaboration is not an overnight achievement but a continuous process of striking a dynamic balance between technical feasibility, commercial sustainability, and ethical standards. Regulatory frameworks such as the EU's Platform Work Directive provide external impetus for this endeavor, explicitly requiring platforms to explain algorithmic decisions under specific circumstances, establish appeal mechanisms, and conduct regular algorithm impact assessments. Driven by robust regulatory mandates and public pressure, leading practices and design principles have begun to emerge, offering valuable benchmarks for the industry.

4.1 Design principles: Integrating ethics from the source

1) Value-Sensitive Design: From the earliest stages of algorithm design, ethical values such as fairness, transparency, and respect should be established as core design objectives, rather than being added as patches during later development phases. This requires interdisciplinary collaboration, involving ethicists, sociologists, and worker representatives from the outset.

2) Transparency by Default: Platforms should make the disclosure of algorithmic rules and decision-making logic their default setting, with only limited protection applied when involving core business secrets. Published transparency reports and audit logs should serve as standard practices to demonstrate compliance and social responsibility.

3) Human-in-the-Loop: Any automated decision-making process that significantly impacts workers (e.g., account suspension or substantial income reduction) must include human review and intervention. This ensures that technology remains a tool to support human decision-making rather than a dominant force replacing human judgment.

4.2 Technology and governance practices

1) Development and Application of Fairness Enhancement Algorithms: Researchers and technology companies are actively exploring technical pathways to balance efficiency and equity—for example, incorporating compensatory weights for disadvantaged groups within algorithmic models, or designing probabilistic scheduling systems that guarantee minimum order flows. Research projects such as FairFoody have demonstrated the feasibility of improving income equity among delivery riders without significantly sacrificing operational efficiency. Furthermore, a number of leading platforms have begun implementing Algorithmic Impact Assessment (AIA) mechanisms, systematically evaluating the potential effects of new dispatch or pricing algorithms on different worker populations prior to

deployment—shifting the governance posture from reactive remediation to proactive prevention.

2) **Algorithmic Audit and Impact Assessment:** Independent third-party algorithm auditing is becoming an industry standard. A comprehensive algorithm audit generally covers three dimensions. First, compliance auditing at the technical level, which verifies whether the operational logic of algorithms complies with established fairness standards and regulatory requirements. Second, impact assessment at the outcome level, which measures the impact of algorithms on income distribution among workers in different groups (classified by gender, age, region and other dimensions) by analyzing real-world data, and identifies whether systematic structural inequalities exist. Third, procedural review at the process level, which evaluates whether the update and iteration of algorithms have undergone adequate consultation with stakeholders and ex-ante risk assessment. At present, some leading audit institutions have developed standardized "Algorithm Fairness Assessment Frameworks", providing horizontally comparable scoring systems for different platforms, enabling the public to compare and supervise the algorithmic ethics performance of major platforms based on objective data. In practice, regular algorithm auditing also carries significant internal governance value for platforms themselves — audit findings can often identify systematic biases overlooked by platforms themselves, provide data support for continuous algorithm optimization, send signals of responsible governance to investors and partners, and evolve into quantifiable commercial reputation assets in the long run.

3) **Collaborative Governance Involving Workers:** Some platforms have begun establishing regular communication mechanisms with workers. For example, Didi Chuxing solicited drivers' feedback on its ride assignment rules and made corresponding adjustments. This approach of involving workers in the formulation and iteration of algorithmic rules represents a significant step toward algorithmic democratization. From a broader perspective, the concept of collaborative governance transforms gig workers from passive rule recipients into active stakeholders with genuine participation rights. This not only ensures algorithm design better aligns with real labor practices and reduces rule failures caused by information asymmetry, but also carries profound empowerment implications: when workers' voices genuinely influence algorithmic rule development, their sense of control over work and their status as active participants is fundamentally enhanced, thereby providing solid institutional support for the value orientation shift discussed in this paper, as is shown in Table 1.

Table 1. Three Transformation Pathways

Pathway	Mechanism	Outcome
Transparency → Competence → Development	Clear rules enable mastery and goal-orientation	Shift from passive executor to active optimizer
Fairness → Relatedness → Identity	Trust-building through distributive/procedural justice	From "tool" mentality to professional pride
Accountability/Autonomy → Autonomy → Dual Reinforcement	Control through appeal channels and choice	Intrinsic motivation strengthens both orientations

5. Conclusions and prospects

Despite the promising prospects of ethical algorithms, their transition from theoretical visions to large-scale implementation faces three significant challenges that cannot be overlooked. Addressing these challenges and exploring practical solutions are essential prerequisites for advancing ethical algorithms from advocacy to concrete implementation.

1) **The Tension in Business Logic:** A platform's profit model relies heavily on extreme efficiency optimization. Implementing ethical algorithms may temporarily increase operational costs or sacrifice some efficiency, requiring companies to demonstrate long-term strategic vision and social responsibility. However, growing evidence shows that the relationship between algorithmic ethics and commercial interests is not a zero-sum game. Enhancing employee satisfaction and retention rates significantly reduces recruitment and training costs; meanwhile, higher service quality and stronger platform trust effectively boost user engagement and purchase frequency, achieving a win-win for both commercial and social value over the long term.

2) **Technical Complexity:** "Fairness" is itself a complex, multi-dimensional social concept, and translating it accurately into computable mathematical models remains a formidable technical challenge. Enhancing algorithmic explainability—especially for complex deep learning models—continues to be an active area of technical development. Additionally, workers' understandings of and demands for

"fairness" and "transparency" differ substantially across cultural contexts and labour market environments. This means that ethical algorithm design cannot rely on a one-size-fits-all global template but requires continuous contextual adaptation, placing greater demands on platforms' capacity for technical iteration.

3) The Risk of "Ethical Blowing-Off ": Some platforms may exploit "ethics" as a public relations pretext to publish superficial transparency reports or establish symbolic complaint channels, engaging in what is known as "Ethics Washing". This requires robust external oversight and independent social monitoring mechanisms to identify and curb such practices. The key to preventing ethics washing lies in establishing quantifiable and verifiable algorithmic ethics evaluation standards, while granting regulatory authorities and third-party auditing bodies adequate data access. Only when algorithmic ethics claims can be substantiated by objective evidence will workers and the public be able to distinguish genuine ethical improvements from mere image management, thereby creating an effective deterrent against ethical misconduct.

At this pivotal moment when global algorithmic governance frameworks are coming into full effect, driving the ethical transformation of algorithms is not merely an option but an irreversible trend. The three transformation pathways identified in this paper—transparency activating competence and a development orientation, fairness cultivating relatedness and an identity orientation, and accountability with autonomy jointly reinforcing intrinsic motivation—together constitute a coherent mechanism through which ethical algorithms reshape gig workers' value orientations, offering a theoretical reference for understanding how technical design choices profoundly shape the human value world. Looking ahead, as artificial intelligence continues to evolve and algorithms become ever more deeply embedded in labour processes, the implementation of ethical algorithms should be understood not as a destination but as a continuously iterating and deepening dynamic process. Ultimately, an algorithm imbued with human dignity will not merely coordinate vehicles and orders; it will unlock the latent professional pride and creative potential of hundreds of millions of workers, steering the gig economy toward a genuinely shared and sustainable future.

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