

# From Technological Rationality to Algorithmic Rationality: Contemporary Extension of Marcuses Critique of One-Dimensional

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## Abstract

In his seminal work "The One-Dimensional Man", Herbert Marcuse profoundly exposed how advanced industrial societies constructed a new social control mechanism through technological rationality. This system renders individuals incapable of critical and negationist thinking beneath the veneer of material abundance, reducing them to "one-dimensional" beings devoid of transcendental dimensions. This paper argues that algorithmic technologies in the digital capitalism era represent an intelligent extension and reinforcement of Marcuses critical technological rationality. By systematically examining Marcuses core propositions of technological domination—such as the suppression of social contradictions through technological rationality, the dialectic between authentic and artificial needs, and cultural field integration—and contextualizing them within platform capitalism and gig economy frameworks, the study reveals how algorithms collude with capital logic to create more covert, efficient, and comprehensive forms of labor control. Research demonstrates that algorithmic systems in gig economies not only perpetuate the material control dimension of traditional technological domination but also employ mechanisms like data-driven surveillance, gamified incentives, and cultural shaping to implement "hyper-linear discipline" on workers physical and mental states, fostering deeply internalized "false freedom" and "false needs." This results in workers experiencing deeper self-alienation and one-dimensionality beneath the facade of flexible employment. Finally, the paper builds upon Marcuses criticalThe study explores potential pathways to revive critical thinking in the digital age, arguing that overcoming algorithmic one-dimensionality requires cultivating technological-political awareness, advancing algorithmic democratization, and reestablishing workers critical consciousness. This research not only expands the explanatory power of Marcuses theory in contemporary contexts but also provides a new theoretical perspective for understanding labor alienation under digital capitalism.

## Keywords

Marcuse; One-dimensional Man; Technological Rationality; Algorithmic Domination; Gig Economy.

## 1. Introduction: Contemporary Dilemma of Technological Rationality and Theoretical Re-start

### 1.1. Research Background and Problem Awareness

When Herbert Marcuse published "One-Dimensional Man" in 1964, he confronted a developed industrial society marked by material abundance yet spiritual impoverishment. With sharp philosophical insight, he diagnosed the societal malaise: technological rationality had transcended its instrumental scope, evolving into a new form of ideological control and social domination. The productivity gains and material wealth accumulation brought by technology not only failed to liberate humanity but instead molded individuals into "one-dimensional

beings" compliant with established orders-by creating "false needs," suppressing critical thinking, and erasing cultural transcendence. Marcuses critique served as a mirror reflecting the profound paradox of industrial civilization: the more freedom there is, the deeper the constraints; the greater the abundance, the weaker the critique.

More than half a century later, human society has entered a new phase of digital capitalism. Digital technologies centered on big data, artificial intelligence, and cloud computing-particularly algorithmic systems-are reshaping all aspects of social life with unprecedented depth and breadth. In this process, the gig economy has rapidly emerged as a new form of labor organization, becoming the most typical labor practice field of platform capitalism. Hundreds of millions of gig workers, including food delivery riders, ride-hailing drivers, and freelance programmers, appear to enjoy "flexible employment" and "self-arranged work," yet they are actually trapped in a precision-controlled network structured by algorithms. These algorithms not only assign tasks and set pricing, but also achieve deep intervention and comprehensive management of the labor process through mechanisms like data collection and analysis, behavioral prediction and guidance, performance incentives and penalties.

This reality compels us to re-examine Marcuses seminal proposition: In the algorithmic era, does technological rationality perpetuate and reinforce its governing logic through new forms? Does the pervasive use of algorithms in the gig economy signify an intelligent evolution of the "unidirectional" control Marcuse criticized? More crucially, how do the collusion between algorithms and capital create novel forms of labor objectification and alienation? These questions constitute the core concerns of this study.

## 1.2. Literature Review and Research Positioning

Marcuses theory of technological critique builds upon and expands Marxs theory of alienation and Lukácss theory of reification, while incorporating Heideggers philosophy of technology and Webers theory of rationalization, forming a distinctive critical perspective. In his seminal work "The One-Dimensional Man", he systematically demonstrates how technological rationality transforms from a liberating force into a tool of domination-a framework that remains highly explanatory today.

Contemporary research on platform capitalism and digital labor can be broadly categorized into three approaches: First, the political economy critique approach, which examines the accumulation logic of platform capital and new forms of labor exploitation; second, labor process studies analyzing how algorithms reshape labor control and worker resistance; third, technological philosophy and ethics discussions focusing on the social impacts and governance of algorithms. While these studies partially address Marcuses themes, they rarely systematically engage in deep dialogue between classical critical theories and contemporary algorithmic practices. This papers research positioning lies precisely here: using Marcuses theory of technological domination as a theoretical framework and the algorithmic practices of the gig economy as an empirical field, it combines theoretical deduction with phenomenological analysis to reveal new characteristics, mechanisms, and dilemmas of technological rationalitys dominance in the algorithmic era. This not only serves as a contemporary test and extension of Marcuses theory but also represents an attempt to deepen the theoretical exploration of digital labor studies.[1]

## 1.3. Research Methods and Structure

This study employs a dual methodology of theoretical analysis and empirical interpretation. First, it systematically examines the core propositions of Marcuses theory of technological domination to establish an analytical framework. Subsequently, this framework is applied to analyze the algorithmic practices of the gig economy, demonstrating the theorys contemporary

relevance through extensive empirical evidence. Finally, the study concludes with a comprehensive discussion, proposing critical reflections and potential solutions.

The text is structured into five chapters: Chapter 1 provides an introduction, outlining the research context, problem awareness, and methodology; Chapter 2 systematically expounds on Marcuses theory of technological domination and establishes an analytical framework; Chapter 3 examines how algorithms facilitate the intelligent upgrading of technological control; Chapter 4 explores algorithms reshaping of need systems and consent manufacturing; Chapter 5 investigates algorithms shaping of cultural domains and their unidirectional reproduction; Chapter 6 concludes with a comprehensive discussion, proposing potential liberation in the digital age.

## **2. The Core Proposition of Marcuses Theory of Technological Domination**

Marquuses diagnosis of the developed industrial society is based on the profound analysis of the essence of technological rationality. He believes that technology has changed from a simple production tool to the principle of social organization and the core of ideology, which brings about a fundamental change in the form of social control.

### **2.1. The Paradox of Technological Rationality: From Liberation to Enslavement**

Marxus begins by exposing a fundamental paradox of advanced industrial society: all freedom exists to "freedom from freedom". While technological progress liberates humans from arduous physical labor and material scarcity, creating unprecedented material abundance and consumption possibilities, this liberation proves limited and one-sided. When technology permeates every aspect of social life and becomes the dominant principle governing social production and reproduction, it paradoxically generates new forms of constraint. When power and freedom-originally meant to be critical-get institutionalized, they lose their critical nature, or as Marxus puts it, "accomplishment nullifies the premise". This insight reveals the dialectical essence of technological rationality: the progress achieved through technology often obscures or dissolves the foundational conditions that enabled it (including critical thinking and genuine freedom). In advanced industrial societies, individual free choices increasingly occur within parameters set by technological systems, where seemingly autonomous decisions are actually conforming to systemic logic.[2]

The peculiarity of this control lies in its concealment and rationality. Technological control appears to genuinely embody rationality that benefits the entire social group and public interests, rendering all contradictions seemingly irrational and all oppositions impossible. The technological system establishes its legitimacy under the banners of efficiency, progress, and public welfare, while any challenge to the system is readily labeled as "irrational" or "anti-progress." This precisely reveals the mechanism of what Marcuse termed "unidimensional thinking" -the critical and negative dimensions of thought are progressively eroded, leading people to increasingly seek solutions within the system itself rather than questioning its very existence.

### **2.2. The Dialectics of Real Needs and False Needs**

Marcuses analysis of "needs" stands as one of the most original contributions to his theoretical framework. He distinguished between "real needs" and "false needs." The latter refers to externally imposed demands for specific social benefits that perpetuate hardship, aggression, suffering, and injustice. Most contemporary needs-such as information, entertainment, consumer behavior shaped by advertising, and the love-hate complex toward others preferences-fall under this category. This distinction reveals the ideological mechanisms of consumer society. Through mass media, advertising, and education systems, industrialized societies continuously create and reinforce specific consumption desires and lifestyles,

presenting these "false needs" as natural, universal, or even freely chosen outcomes. "If the maintenance of goods and services sustains the social control of a life marked by hardship and fear-meaning if it perpetuates alienation-then the free choices made within these systems do not signify true freedom." [3]

More profoundly, Marcuse identified the psychological mechanism of internalization: "As long as individuals are controlled and indoctrinated with assimilative ideologies, their responses cannot be considered genuine expressions of their own." [4] When individuals perceive socially imposed needs as their authentic desires, domination ceases to be external oppression and becomes internalized identification. This internalization renders resistance difficult, as it appears to be a confrontation with ones own "true" desires.

### **2.3. The Disappearance of the Dimension of Integration and Transcendence in the Cultural Field**

Marcuses analysis of the cultural sphere is equally profound. He refers to critical and transcendent culture as "high culture," which provided space and resources for negative social thinking in the pre-technological era. Functionally and chronologically, high culture was a pre-technological culture, largely a feudal culture, as it possessed the power to negate and critique reality. However, in advanced industrial societies, this high culture faced systematic eradication. Rejected by reality, its various cultural values were incorporated into established orders and reformed into institutionalized culture. Marcuse identified two primary mechanisms of vulgarization: first, the commercialization of cultural products into mass consumer goods; second, the politicization of grand concepts like freedom and liberation, reducing them to operational terms and stripping away their critical essence.

The most severe consequence of this cultural integration is the disappearance of societys transcendent dimension. The "inner" dimension that could deeply root opposing ideologies is weakened, which is the cradle of rational critical thinking and the power of negative reflection. When culture no longer provides resources for transcending reality or critiquing the status quo, society truly becomes a "unidimensional" existence-only affirmation and compliance, devoid of negation and transcendence.

### **2.4. Political Enclosure and Inclusion of Opposites**

Marcuses political analysis foreshadowed what later scholars termed the "end of history" phenomenon. In advanced industrial societies, political opposition has been systematically integrated into existing institutions, losing its revolutionary potential. The opposition groups now incorporate the very classes that were once the foundation of institutional progress-specifically, the working class, which historically stood in opposition to the entire system. This integration occurs through multiple mechanisms: improved material living standards weaken the revolutionary consciousness of the working class; welfare state policies transform class conflicts into technical management issues; and mass culture erodes the perception of class distinctions. This similarity does not signify the disappearance of classes, but rather reflects the extent to which individuals under existing systems share the needs and satisfactions required to maintain them.

The political spheres insularity is further manifested in the consolidation of discursive frameworks. "Ideas, aspirations, and objectives that transcend established discursive and behavioral domains are either excluded or assimilated into these frameworks." Radical political demands are either marginalized or incorporated into mainstream discourse, transforming into manageable policy agendas. This creates a political arena that appears pluralistic on the surface yet remains fundamentally integrated, where any vision of radical transformation struggles to gain legitimacy.[4]

Marcuses analytical framework establishes a comprehensive critique: technological rationality constructs a highly integrated, self-sustaining unidimensional society by reshaping the system of needs, erasing cultural transcendence, and accommodating political opposition. In subsequent chapters, we will demonstrate that this framework not only remains valid in the digital capitalism era but is further reinforced in more complex and covert forms.

### **3. Intelligent Upgrade of Algorithm: From Mechanical Automation to Superlinear Discipline**

While the "automation" of Marcuses era retained mechanical and rigid characteristics, the algorithmic systems of the digital age have given rise to a new form of control-intelligent, dynamic, and highly personalized "hyperlinear discipline". This transformation is particularly evident in the gig economy, where algorithms not only assume the roles of traditional managers but also achieve unprecedented precision and depth in control.

#### **3.1. Algorithm as the Digital Embodiment of Technological Rationality**

Marcuse observed: "The inescapable reality that machines surpass individuals and any specific group in material power renders them the most potent political instrument in any society structured around machine production programs." In the digital age, this insight requires modernization: algorithms cognitive power outstrips the decision-making capacities of any individual or collective, establishing them as the dominant political tool in any data-driven society.[5]

At its core, an algorithm is a decision-making system that transforms inputs into outputs, yet in the context of platform capitalism, it transcends this basic function. As the technological embodiment of capital logic, algorithms represent the codified implementation of profit-maximization principles. They inherit all the traits of technological rationality criticized by Marcuse: legitimizing themselves under the banners of efficiency, optimization, and scientific rigor; reducing complex social relations to computable and manageable technical problems; and creating system orders that appear objectively neutral but are inherently value-laden.

More importantly, algorithms have elevated the logic of technological rationality to unprecedented heights. While traditional industrial societies primarily controlled material production and physical labor, algorithmic control now extends to broader domains including cognition, emotions, and social relationships. Through data collection and analysis, algorithms not only track workers actions but also predict their potential behaviors and appropriate actions, enabling real-time intervention and guidance.

#### **3.2. Algorithmic Control Matrix in the Gig Economy**

In the practical implementation of the gig economy, the algorithmic system constructs a multi-dimensional, end-to-end control matrix, which comprises at least four interrelated tiers:

##### **(1) The Temporal and Spatial Colonization of Labor Process**

Traditional factory labor confines workers within fixed spaces (workshops) and schedules (work schedules), while the algorithmic control of gig economy achieves more flexible and thorough temporal-spatial colonization of laborers. Take food delivery platforms as an example: algorithms through intelligent dispatch systems plan optimal delivery routes for each rider in real time, calculate the most reasonable order sequence, and set delivery deadlines for each order. Workers may appear to have free choice in accepting orders, but in reality, the systems dispatch logic, reward-punishment mechanisms, and ranking algorithms collectively form an invisible control network. This control is characterized by its "hyperlinearity" -algorithms dont simply dictate work rhythms but dynamically adjust labor requirements based on multidimensional variables such as real-time traffic data, weather conditions, restaurant meal

preparation speed, and historical delivery performance. Workers must remain constantly vigilant, ready to respond to system commands at any moment, with their work-rest boundaries becoming blurred and working hours effectively extended indefinitely.

#### (2) Data-driven Monitoring of Physical Fitness and Performance

Another hallmark of algorithmic control lies in the comprehensive collection and utilization of data. On gig economy platforms, nearly every workers action is digitized: response times to orders, delivery routes, delivery punctuality, customer ratings, complaint records, and more. These data points serve not only real-time management (such as order allocation) but also feed into sophisticated algorithmic models to calculate performance metrics like workers "credit scores," "activity levels," and "service quality indices."

This digital surveillance system represents an upgraded version of Foucault's "panopticonism" in the digital era. Workers are aware their actions are continuously recorded and evaluated, yet remain unaware of the exact criteria and algorithmic parameters (the "black box" nature of algorithms). This uncertainty drives workers toward "self-regulation" -adjusting behavior not by explicit rules, but by their presumed algorithmic preferences. For instance, delivery riders might proactively accept more orders and expedite deliveries, even if it means running red lights or sacrificing rest, convinced (or led to believe) that such actions boost system ratings and secure better orders.

#### (3) Algorithmic Manipulation of Labor Pricing

Traditional labor economics assumes wages are determined by market supply and demand. However, gig economy platforms employ algorithmic pricing systems that create highly opaque pricing mechanisms. Dynamic pricing on ride-hailing platforms, subsidy and deduction rules for food delivery services, and bidding mechanisms for crowdsourcing platforms are all calculated in real-time by complex algorithms. These algorithmic pricing systems exhibit four key characteristics: First, they are highly dynamic, with prices potentially changing every minute. Second, they are personalized, meaning different users and workers may see different prices. Third, they lack transparency, as the specific parameters of pricing algorithms are often classified as trade secrets. Finally, they involve power asymmetry, where platforms hold ultimate pricing authority while workers can only choose to accept or decline offers-though refusal may affect future job opportunities.

#### (4) Algorithmic Mediation of Social Relationships

Algorithms not only regulate the relationship between workers and their tasks, but also reshape social dynamics among workers and between workers and consumers. A prime example is the rating system: consumers evaluations of workers directly impact their order opportunities and earnings, which may lead to excessive customer appeasement or even abuse of rating power. Meanwhile, algorithmic systems intensify competition among workers by frequently displaying rankings and setting contests, effectively framing the relationship as a zero-sum game.

### 3.3. Ideological Operation of Algorithmic Control

Marcuse emphasizes that the effectiveness of technological domination lies in its ideological dimension, which can present domination as rationality, progress, or even freedom itself. In this regard, algorithmic control has reached new heights.

#### 3.3.1. The Hegemony of Efficiency Discourse

Algorithmic systems legitimize their existence through discourses like "optimizing resource allocation," "enhancing social efficiency," and "reducing transaction costs." While these claims may seem unassailable-after all, who could deny the importance of efficiency? The crux lies in defining "whose efficiency" and "what kind of efficiency." Platform algorithms typically prioritize maximizing profits and optimizing user experience, while labor rights, work-life

balance, and long-term career development are either excluded from optimization functions or given minimal weight.

### 3.3.2. The Myth of Technological Neutrality

Algorithms are often portrayed as objective, neutral, and scientific tools, free from human bias. This myth of "technological neutrality" obscures the social construction of algorithms: they are designed by humans, reflecting the value judgments and interests of their creators; the training data they use comes from the real world, inevitably replicating and amplifying social inequalities; and their application scenarios and evaluation criteria are also products of social selection.

### 3.3.3. Illusion of Free Choice

The gig economy's most powerful ideological claim is "freedom" -the freedom to schedule work hours, choose work locations, and determine work intensity. This "freedom" holds some truth, as workers do enjoy greater autonomy than traditional factory workers. However, Marcuse's warning proves particularly insightful here: Free choice only matters when there are genuine needs and viable alternatives. When algorithmic systems, through carefully designed incentive structures, steer workers "free choices" toward desired outcomes, this freedom becomes a "voluntary shackle." Take gamification design as an example: many gig platforms design work as games-earning points for completing tasks, winning badges for achieving goals, and ranking on leaderboards for outstanding performance. Workers may immerse themselves in the thrill of "leveling up and defeating monsters," yet overlook the fact that this is essentially a labor control technique-gamification packages alienated labor as entertainment, transforming economic coercion into psychological incentives.

## 3.4. Political Economy of Algorithmic Control

Algorithmic control not only changes the process of labor, but also has a profound impact on political economy.

First, it amplifies the power of capital. Through algorithms, platform capital can regulate labor supply with unprecedented precision and real-time responsiveness, control labor processes, and extract surplus value. The balance in traditional labor-capital relations, which relied on collective bargaining, has been shattered. Workers now confront not specific managers, but algorithmic systems that appear objective and unnegotiable.

Secondly, it has reshaped the class structure. Gig workers occupy a paradoxical class position: they own the means of production (smartphones, transportation), yet must rely on platforms to access them; they appear independent but are in fact highly dependent; they bear operational risks (e.g., vehicle wear and tear, accident risks) without sharing the profits. This ambiguous class identity weakens class consciousness and the potential for collective action.

Ultimately, it generates new forms of inequality. Algorithms may replicate and amplify social biases through historical data-such as favoring certain groups with high-value orders, enabling price discrimination via personalized pricing, or allowing rating systems to be influenced by consumer biases. These inequalities are often packaged as "personalized services" or "market choices," making them hard to challenge.

Marcuse once cautioned: "The most effective and enduring form of resistance against liberation is to instill material and spiritual needs that perpetuate obsolete forms of the struggle for survival." [6] In the algorithmic era, this warning takes on new significance: algorithms perpetuate labor exploitation by creating and satisfying "false needs," even transforming it into an experience of freedom and achievement. This is precisely the subject we will explore in depth in the next chapter.

## 4. The Need for a New System: From Welfare State to Platform Welfare

Marcuse's analysis of "false needs" reveals how advanced industrial societies exercise social control through the management of need systems. In the era of platform capitalism, this mechanism not only persists but has evolved into more sophisticated and pervasive forms through integration with algorithmic technologies. Gig economy platforms ingeniously transform the logic of capital accumulation into workers' internalized "needs" through carefully designed gamified incentives, hierarchical structures, and community cultures, thereby creating a new form of "platform welfareism".

### 4.1. The Need for Production Mechanism under Platform Capitalism

Marcuse argues that the needs imposed externally on individuals for specific social interests—those that perpetuate hardship, aggression, suffering, and injustice—are false needs. In the gig economy, platform algorithms serve as the technological agents of this specific social interest, namely capital accumulation, by creating and reinforcing particular need structures through multiple mechanisms.

#### 4.1.1. Gamification: Transforming Labor Alienation into Psychological Needs

Gamification stands as the most prominent technological innovation in platform algorithmic design. By incorporating game elements like points, badges, leaderboards, levels, and virtual currency, platforms transform monotonous, repetitive, and even hazardous gig work into sustained challenges and competitions. Take food delivery platforms as an example: riders aren't simply earning money through food delivery, but are driven by "challenging the top tier," "unlocking rare achievements," and "climbing city rankings." The brilliance of this design lies in its conversion of external economic coercion (survival through earnings) into intrinsic psychological motivation (desire to win, progress, and recognition). Workers may voluntarily extend working hours for a virtual badge or risk increasing delivery speed for a ranking boost. Through this process, the platforms' value objectives (improving delivery efficiency and increasing order volume) are perceived as personal achievement needs for workers.

Gamification has given rise to a new labor ethic: moving beyond the traditional "diligence leads to prosperity" to embrace "playful work"—approaching labor with a gaming mindset that turns labor into entertainment. The danger of this ethic lies in blurring the line between work and play, making it harder for workers to recognize their exploitation and organize to fight for their rights.

#### 4.1.2. Algorithm-driven Personalized Incentives

Big data-powered algorithms can create detailed behavioral profiles for each worker, enabling personalized incentive plans. For example, the system might detect that a rider is more active during weekend afternoons and offer tailored rewards for that time slot. Similarly, it could identify drivers who prefer long-distance orders and prioritize pushing such requests with additional subsidies.

This personalized incentive mechanism operates through a dual mechanism: while it genuinely accommodates individual differences and preferences among workers, it simultaneously enables the platform to exercise more precise and covert control. Workers perceive a "system that understands me" and "customized solutions for me," yet seldom recognize that such "personalization" fundamentally serves the platform's profit-maximization calculations. Moreover, the incentive system creates divisions within the workforce—different individuals facing varying incentive schemes struggle to form unified demands or collective actions.

#### 4.1.3. Community Building and Sense of Belonging

Many gig economy platforms actively build online communities, such as rider forums, driver groups, and task-sharing groups. While these communities appear to be spaces for workers to

exchange information and share experiences, they also serve ideological purposes. By promoting "striver stories," "order-taking techniques," and "system guides" through these communities, platforms cultivate a culture that glorifies compliance with their rules.

In these communities, success is often defined as "mastering the system" rather than challenging or changing it. Complaints about algorithmic unfairness may be marginalized, while posts proposing collective action could be deleted or ignored. Conversely, content sharing "how to gain an advantage within the system" tends to go viral. Through these communities, platforms successfully convert a segment of workers into propagators of their ideology, achieving decentralized control and self-replication.

## **4.2. The Double Mask of Platform Welfare**

Marcuse once analyzed how the welfare state provides material security in exchange for political compliance. In the era of platform capitalism, a new form of "platform welfareism" is emerging, combining certain characteristics of traditional welfare with the unique capabilities of digital technology.

### **4.2.1. "Welfare" as a Control Measure**

The "benefits" offered by gig platforms typically manifest as rewards, subsidies, and insurance. For instance, task completion targets may yield bonuses, maintaining high ratings can secure priority assignments, and reaching a certain working hours may qualify for medical insurance subsidies. While these benefits appear to be care and protection for workers, they are in reality sophisticated control mechanisms.

First, benefits are often subject to stringent conditions. To qualify for a particular benefit, workers must meet specific behavioral requirements-such as maintaining a certain order acceptance rate, sustaining a specific rating level, or achieving a required duration of online presence. This essentially leverages benefits as a tool to guide workers toward working in a manner that aligns with the platforms expectations.

Secondly, welfare design is deeply rooted in psychological principles. Many benefits operate on the loss aversion principle-workers who attain a certain rank or gain a privilege may lose it if their performance declines. The pain of losing something is often more intense than the regret of never having it, thus motivating workers to maintain their performance.

### **4.2.2. Required Hierarchy and Relative Deprivation**

The platforms algorithm categorizes workers into distinct tiers through a nuanced hierarchy, with each tier receiving a tailored welfare package. This design cultivates a perpetual upward mobility dynamic-workers are perpetually motivated to strive for superior benefits at higher tiers.

However, this hierarchical structure also fosters a systemic sense of relative deprivation. Due to opaque algorithmic parameters and frequent adjustments, workers often struggle to understand why they fail to advance or get abruptly demoted. They tend to blame their own shortcomings-lack of effort or skill-rather than systemic flaws. This self-justification further reinforces their compliance with the platform.

More insidiously, platform-based benefits often replace rather than supplement public welfare. When workers obtain basic protections (such as accident insurance) through these platforms, they may reduce their reliance on public social welfare or accept more precarious employment arrangements. This effectively shifts part of the costs of social reproduction onto individual workers while eroding the political foundation of collective welfare.

## **4.3. The Need for Truth: The Shading and Alienation**

Marquase pointed out that the fundamental problem is how to create the conditions of freedom when people themselves are the object of effective rule.

### 4.3.1. Systematic Concealment of Truthful Needs

The demands of platform manufacturing have grown so overwhelming that workers genuine needs-such as dignified working conditions, reasonable working hours, sustainable income, career development opportunities, and social interaction needs-are often marginalized or redefined. For instance, "career development" may be redefined as "promotion within the platforms hierarchy," while "social interaction" could be transformed into "engagement within the platforms community."

The danger of this redefined concept lies in workers gradually losing the ability to define their own needs. Instead of asking What kind of work and life do I want?, they start asking How can I gain more from the system?. When false needs are perceived as genuine, the prerequisite for liberation-the recognition of authentic needs-disappears.

### 4.3.2. New Dimensions of Alienation

The alienation of labor analyzed by Marx has been deepened in the algorithm era:

(1)Data Alienation: Workers generated data (including behavioral, performance, and social data) is exploited by platforms without compensation, used to refine algorithms, train models, and create value. Workers neither own nor control this data. Ironically, the data they produce becomes a tool to control them, making data alienation a deeper manifestation of labor product alienation.

(2)Decision Alienation:Algorithms are increasingly taking over labor decision-making--determining which orders to accept, which routes to take, how much to charge, and how to interact with customers. Workers have been reduced from decision-makers to mere executors of algorithmic decisions, with their professional expertise, situational judgment, and personal preferences systematically marginalized. The mere execution of decisions has become a mere step in the process, hindering human development. Thus, decision alienation represents an intensification of the alienation of human essence.

(3) Temporal Alienation: Algorithmic control has created fragmented, nonlinear, and ceaseless labor time. Workers cannot plan their own schedules, being compelled to respond to system demands at any moment. The boundaries between work and rest, labor and life, have become blurred. Time is no longer a continuous experience but discrete units fragmented by algorithms. Consequently, labor has transformed into a passive response rather than an active practice, with the alienation of the labor process being further intensified in the algorithmic era.

### 4.3.3. The Dilemma of Resistance

Within such a sophisticated control system, workers resistance encounters unique challenges. Traditional strikes (collective work stoppages) prove ineffective in the gig economy, as platforms can swiftly redirect orders to alternative workers. Collective bargaining lacks clear targets, since algorithms are impersonal, emotionless, and unyielding. Legal action against algorithmic systems is costly and often limited to specific violations, making systemic challenges difficult to pursue.

The more fundamental dilemma lies at the level of consciousness: when workers perceive platform-generated needs as their authentic requirements and treat gamified control as autonomous choices, they may not even feel compelled to resist. Resistance appears not to be about asserting rights, but rather about undermining their "game experience" and "chance for achievement".

Freedom inherently entails negation. In the age of platform capitalism, genuine freedom emerges from rejecting the fabricated freedom and artificial needs created by platforms, and from recognizing that what we perceive as autonomous choices may be meticulously engineered controls. Yet in an environment where algorithms comprehensively shape

consciousness, restoring this critical awareness is becoming increasingly challenging. This very question will be explored in the next chapter.

## **5. Algorithmic Shaping of Cultural Field: From the Elimination of High-level Culture to the Prevalence of Operationalism Culture**

Marcuses lament over the demise of "high culture" has found new resonance and more complex manifestations in the digital age. While the vulgarization of high culture in advanced industrial societies was primarily driven by commercialization and politicization, the platform capitalism era has seen algorithms emerge as the new agent of cultural shaping. These algorithms not only influence cultural production and dissemination at macro levels, but also create a novel "operationalist culture" at micro levels-particularly in the concrete contexts of gig labor. This culture, centered on adaptation, optimization, and efficiency, systematically excludes critical and reflective modes of thinking.

### **5.1. New Mechanism of Cultural Integration in the Algorithmic Era**

Marcuse observed: "If mass media can seamlessly blend art, politics, religion, philosophy, and commerce, they will imbue these cultural domains with a shared characteristic—the commodity form." In algorithm-driven digital platforms, this process is accelerated and intensified. Algorithms not only facilitate the commodification of culture but also create new forms of cultural control through mechanisms like personalized recommendations, traffic distribution, and content moderation.[7]

#### **5.1.1. Ideological Function of the Recommended Algorithm**

Recommendation algorithms represented by platforms such as Toutiao, TikTok, and YouTube are reshaping the way people access cultural content. These algorithms predict user preferences based on behavioral data and push relevant content, creating so-called "filter bubbles" or "echo chamber" effects. Users are increasingly confined to content that aligns with their existing views and interests, with fewer opportunities to encounter heterogeneous information and critical perspectives.

This effect is particularly pronounced among gig workers. Algorithms may prioritize content related to "striving," "success studies," and "side hustle earnings," reinforcing their existing labor perspectives while filtering out information about labor rights, collective action, and social critique. Over time, workers information environment becomes highly homogenized, making it difficult to develop cognitive frameworks that transcend the platforms logic.

#### **5.1.2. Cultural Politics of Flow Distribution**

On digital platforms, traffic is a scarce resource controlled by algorithms. What gets recommended or hidden, which creators gain exposure or get marginalized-all these are deeply influenced by algorithmic logic. This traffic distribution essentially exercises cultural power, subtly shaping what counts as "important," "interesting," or "valuable" cultural standards.

For content created by gig workers (such as short videos sharing work experiences or posts discussing platform rules), the platforms algorithm tends to prioritize recommendations for content that is positive, practical, and aligns with the platforms values. Criticism on the platform may not be directly removed, but it could also go unnoticed due to lack of recommendation. This soft censorship is more covert and effective than traditional hard censorship-it allows critical voices to naturally "silence" rather than forcibly "ban" them.

### **5.2. Operationalism Culture in Gig Work**

In the context of the gig economy, algorithms have given rise to a distinctive subculture termed "operationalist culture." This culture materializes Marcuses critique of "operationalism" -a

philosophy that rejects concepts unexplainable through operational or behavioral means-into everyday labor practices.

### **5.2.1. The Hegemony of Pragmatic Discourse**

In the online communities and offline interactions of gig workers, a highly pragmatic discourse system dominates. Discussions focus on: how to improve order acceptance efficiency? How to achieve higher ratings? How to adapt to platform rule changes? How to maximize income? These questions share a common characteristic: they all seek technical solutions within the framework established by the platform.

This pragmatic discourse dismisses more fundamental questions: Are the platforms rules inherently reasonable? Is the algorithmic design fair? What are the social consequences of the gig economy? Such inquiries are often dismissed as "unrealistic," "theoretical platitudes," or even "negative." Workers are encouraged to become "problem solvers" rather than "questioners," and "system optimizers" instead of "system critics."

### **5.2.2. Internalization of Data Thinking**

A defining feature of algorithmic culture is the pervasive adoption of data-driven thinking. In gig economy contexts, workers increasingly rely on data to comprehend and evaluate their work: daily order counts, earnings, ratings, and rankings. These metrics serve not only practical decision-making (e.g., determining work hours) but also self-assessment and identity construction.

The danger of this data-driven mindset lies in its tendency to reduce complex labor experiences to quantifiable metrics, and to compress multifaceted labor values (such as skill development, social contribution, and self-actualization) into a single economic return. Workers may either deny their overall worth due to unsatisfactory data performance, or sacrifice other vital aspects (like safety, health, and interpersonal relationships) in pursuit of data optimization.

### **5.2.3. The Prevalence of Individualism and Success Theories**

The platform algorithm creates a highly competitive environment through mechanisms such as levels, rankings, and rewards. This environment fosters a form of individualistic success philosophy: success is seen as the result of personal effort, skill, and wisdom, while failure is attributed to personal shortcomings.

In the gig economy community, "successful individuals" (such as delivery riders earning over 10,000 yuan monthly or drivers with perfect ratings) are often idolized as role models, with their "experience-sharing" widely admired. These narratives predominantly emphasize personal perseverance and technical skills, rarely addressing structural factors like platform policies, market conditions, or social support. This narrative reinforces the ideology that "everyone is the master of their own destiny," while obscuring the existence of systemic inequality.

## **5.3. The Deficiency and Reconstruction of Critical Cultural Resources**

Marcuse pointed out that the value of high-level culture lies in its provision of "transcendental factors," which are intellectual resources and imaginative spaces that transcend and critique reality. In the algorithmic-operationalist culture, such transcendental factors are facing systemic deficiency.

### **5.3.1. The Dilemma of Critical Discourse**

In the gig economy context, critical discourse faces multiple challenges. First, it lacks distribution channels-platform-controlled communities often reject critical content, while independent discussion groups have limited influence. Second, it lacks conceptual tools-workers may experience dissatisfaction and oppression but lack theoretical frameworks to analyze these feelings. Third, it lacks practical space-critical thinking that fails to translate into

concrete actions (such as collective resistance) often degenerates into mere complaints, losing its mobilizing power.

### 5.3.2. Fragmentation of Cultural Resistance

Despite facing numerous challenges, various forms of cultural resistance persist among gig workers. These resistances are often fragmented, temporary, and situational: venting about new platform regulations in WeChat groups, sharing experiences of unfair treatment on social media, and creating short videos satirizing algorithms.

The value of these resistances lies in their preservation of critical consciousness and the creation of small spaces for resistance. However, they often struggle to coalesce into systematic critical discourse or sustained social movements. This stems partly from the algorithmic environments inherent characteristics-fragmented information, scattered attention, and unstable communities-and partly from the dominance of an operationalist culture, where even critical engagement tends to remain at the operational level (e.g., criticizing the irrationality of specific rules) rather than the principled level (e.g., questioning the legitimacy of algorithmic governance).

### 5.3.3. Possible Ways to Rebuild the Negative Culture

Facing the challenge of algorithm culture, the reconstruction of negative culture requires multi-level strategies:

At the individual level, cultivating "algorithmic literacy" is essential-understanding how algorithms function, their limitations, and the value assumptions they entail. This literacy does not demand that everyone become a programmer, but rather fosters a critical distance: the ability to use algorithms without fully endorsing them, and to benefit from platforms without internalizing their values.

At the community level, we need to create communication spaces and solidarity models beyond algorithms. Online, we can establish worker communities independent of platforms and explore decentralized communication tools. Offline, we can develop mutual aid networks based on geography, industry, or shared interests. These spaces not only provide practical support but also foster emotional and collective identity, serving as fertile ground for nurturing critical culture.

At the societal level, it is imperative to foster public discourse and democratic oversight regarding algorithms. Algorithms should not be treated as trade secrets or technological black boxes, but rather as subjects of public debate. Mechanisms such as algorithmic audits, transparency requirements, and worker participation in design should be implemented to place algorithmic power under social supervision.

Marcuse once cautioned: "These transformations facilitate the alignment of ideas and objectives with the demands of existing institutions, their incorporation within the system, and the rejection of elements that clash with it." In the algorithmic era, this mechanism of coordination and inclusion has reached unprecedented levels of sophistication. To dismantle this framework and reclaim the transcendence and critical nature of thought constitutes the central mission of cultural resistance in the digital age.[8]

## 6. Conclusion: Negative Thinking Towards the Digital Age

By revisiting Marcuses theory of technological domination and examining it within the context of platform capitalism and the gig economy, this paper reveals how algorithms inherit, reinforce, and transform the logic of technological rationality. Algorithms not only perpetuate Marcuses critique of technological control, manufactured needs, and cultural homogenization, but also elevate these mechanisms to new heights through their digital characteristics-datafication, personalization, real-time processing, and opacity. While gig workers enjoy the illusion of

flexibility and autonomy, they are actually trapped in a more sophisticated control network structured by algorithms, with their labor alienation manifesting as data alienation, decision-making alienation, and temporal alienation.

The profundity of Marcuse lies in his not only diagnosing the malaise but also hinting at a liberating philosophical direction: reviving negative thinking and reconstructing the possibility of transcending reality. In the digital age where algorithms define labor, this direction remains valid, yet its implementation requires rethinking.

### **6.1. Double Breakthrough of Digital Unidirectionality**

The breakthrough of the unidimensional society constructed by the algorithm requires the double efforts of institutional reform and consciousness awakening.

The institutional cornerstone lies in algorithmic democratization. Algorithms should not serve as private instruments of platform capital, but rather become subjects of public discourse, democratic oversight, and social consultation. This necessitates advancing legislation on algorithmic transparency to empower workers and the public with algorithmic interpretation rights; establishing multi-stakeholder governance mechanisms that involve worker representatives in algorithm design evaluations; and developing public digital infrastructure to provide alternatives beyond platform capitalism.

The essence of consciousness lies in cultivating critical technological literacy. Workers and the public must recognize that algorithms are not merely technical tools but also a form of social power. They need to develop the ability to maintain autonomy in algorithmic environments—leveraging technological conveniences without being entirely controlled by its logic. Furthermore, they must reconstruct their understanding of labor dignity, life meaning, and social justice, resisting being entirely defined by data-driven or gamified evaluation systems.

### **6.2. New Imagination of Labor Liberation**

Marcuse reminds us that true freedom is not the freedom to choose one's employer, nor the freedom to choose within defined boundaries, but the freedom to define the scope of choices and create new possibilities. In the gig economy, this means not only improving working conditions on existing platforms, but also imagining and creating new forms of work organization beyond platform capitalism.

Laborer-led platform cooperatives represent a promising approach. Under this model, workers collectively own and manage the platform, with algorithms serving their interests rather than capitals. This fosters fairer value distribution and more democratic labor decision-making. Despite challenges from capital, technology, and scale, this practice holds significant educational value and serves as a model for others.

More fundamentally, it is essential to rethink the relationship between technology and labor. Technology should not merely serve to enhance labor efficiency and capital profits, but must also contribute to labor liberation and human development. This implies that technological design must incorporate the perspective of workers, technological applications must evaluate social impacts, and technological advancement must be guided toward a more equitable, sustainable, and human-centered future.

### **6.3. The Contemporary Value of Marcuse's Legacy**

The revisiting of Marcuse is not to seek ready-made answers, but to restore a questioning approach—one that refuses to be satisfied with superficial prosperity, directly pointing to deep-seated contradictions; one that does not indulge in technological progress, but questions for whom progress serves; one that does not dwell on individual choices, but offers critical insights into structural constraints.

In an era where algorithms permeate every facet of social life, critical thinking has never been more crucial. When algorithms wield control under the guise of "personalization," obscure fairness in the name of "efficiency," and reject democratic discourse through the pretense of "science," we must maintain Marcusean vigilance: technology's liberating potential always carries new risks of enslavement. True progress lies not in adapting to technology, but in harnessing it to serve human emancipation.

The liberation of labor in the digital age is ultimately a struggle of consciousness—a fight against algorithms that reduce humans to mere data points, a fight to restore labor as an expression of life rather than a means of survival, and a fight to rebuild the rich connections between people, between humans and technology, and between humans and the world. In this struggle, Marcuse's "One-Dimensional Man" is not only a mirror reflecting the dilemmas of our time, but also a hammer striking the shackles of our thinking.

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