

The "Collective Worker" under the Reconstruction of Digital Taylorism: A Study from the Perspective of Marxist Political Economy

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Abstract. The concept of the "collective worker" proposed in Marx's Capital reveals the organic integrity of labor cooperation under the conditions of capitalist socialized mass production, and provides a theoretical foundation for us to analyze the evolution of contemporary labor production. The "collective worker" is undergoing a reconstruction in today's digital age. "Digital Taylorism", spawned by digital capitalism, reconstructs traditional workers into "digital collective workers" with algorithmic management, real-time monitoring and space-time compression as its core means. This process deepens the fundamental contradiction between the socialization of production and the private ownership of the means of production, and embodies the real subsumption of labor by capital. Socialism with Chinese characteristics strives for the free time of workers by breaking the monopoly of digital capital, promoting the sharing of data factors, and developing new-quality productive forces, so as to promote the fundamental transformation of the "digital collective worker" into a "digital community", which ultimately points to the all-round free development of human beings. It provides a theoretical and practical framework for understanding and criticizing the new forms of contemporary capitalism.

Keywords: Collective Worker, Digital Taylorism, Digital Capitalism, Marxist Political Economy

1. Introduction

Digital Taylorism is a product of the evolution of Taylorism along with changes in productive forces and production relations. In recent years, transnational tech giants, relying on the world market and the Internet, have promoted digital Taylorism as a new strategy for capitalist production and development in the digital age amid the wave of digitalization, seeking to make it the latest technology to reshape and restructure the economic and labor landscape. In response to this trend, academic circles at home and abroad have incisively revealed how platform capital implements unprecedented fine-grained control over the labor process through means such as data monitoring, algorithmic scheduling and gamified incentives. Both the systematic analysis of algorithmic control mechanisms by foreign scholars and the abundant research evidence provided by domestic scholars based on digital worker groups have greatly deepened our understanding of the mode of capital

control in the digital age. However, what these studies have in common is that their analytical horizons are still largely confined to the micro level of Labor Process Theory (LPT), that is, focusing on the dual interaction of "control-resistance" and how platforms can more effectively dominate "individual workers" [1]. To break through the limitations of previous studies, this paper creatively introduces and reconstructs Marx's category of the "collective worker". The reconstruction of the "collective worker" by digital Taylorism is not merely through simple technical or managerial means, but through the algorithm as a "super brain", it constructs a "digital collective worker" of unprecedented scale, dynamic structure and blurred boundaries. Through digital platforms, this new type of "collective worker" integrates all kinds of workers who produce surplus value in the narrow or even broad sense into a unified proliferation system.

2. Theoretical origins: the historical evolution of Marx's concept of "collective worker"

2.1. The emergence logic of the "collective worker"

From manufacture to large-scale machine industry, the historical emergence of the "collective worker" is closely related to the evolution of the capitalist mode of production, and its background can be attributed to three interwoven aspects.

First of all, the development of social division of labor and cooperation is the direct prerequisite for the emergence of the collective worker. In pre-capitalist individual handicrafts, workers completed most or even all processes of product production, and the direct social nature of labor had not been fully developed. Entering the stage of manufacture, capital concentrates a large number of workers in the same workplace for unified labor, and the commodities produced gradually acquire socialized attributes, which endows the labor process itself with the nature of social combination. Marx pointed out: "Capitalist production actually begins when the same capital employs a larger number of workers at the same time, thus expanding the scale of the labor process and providing a larger quantity of products." Cooperation not only improves individual productivity, but also creates a new social labor productivity of "combined working day", which itself is necessarily "the productivity of social labor or collective force".

Secondly, the deepening of division of labor within manufacture pushes this social combination to the extreme. In order to increase relative surplus value, capital decomposes the craft that could originally be completed by one person into various local processes, each of which is undertaken by specialized workers. These workers repeat highly simplified actions day after day, becoming a "specialized organ" on the body of the collective worker [2]. Social production is formed by the social combination of numerous "one-sided local workers", who are locked in specific simple operation links, and the labor process presents a high degree of continuity, uniformity and regularity. When analyzing manufacture, Marx pointed out that manufacture cripples workers into local workers and fixes local labor capacity as the one-sided function required for capital proliferation. The labor organism formed by the combination of numerous one-sided local workers constitutes the early form of the collective worker.

Finally, the establishment of large-scale machine industry brings a qualitative leap in the form of the collective worker. The use of machines no longer takes the special skills of local workers as the technical basis, but is characterized by the conscious application of science and technology in production. At this time, the collective worker upgrades from simple division of labor and cooperation to the cooperation of the "human-machine system", and labor also becomes social total labor. Mental workers such as engineers, technicians and managers begin to merge into the collective worker in large numbers. Their labor is "separated from the labor of direct production

workers", but both are necessary links in the total chain of value creation [3]. Marx clearly stated in *Capital*: "With the development of the cooperative nature of the labor process, the concepts of productive labor and productive worker must necessarily expand." This marks that productive labor includes not only workers who directly operate machines, but also all workers who "only need to be an organ of the collective worker and perform a certain function belonging to it".

It can be seen that the emergence of the "collective worker" is the inevitable historical result of capital's pursuit of relative surplus value and promotion of labor socialization. It integrates scattered individual labor into systematic overall labor, providing the human basis for the high socialization of capitalist production [4]. The concept itself has become a profound theoretical tool for Marx to analyze the nature of capitalist production labor and reveal the control of capital over labor.

2.2. The core connotation of the "collective worker"

In the first volume of *Capital*, through the investigation of the production of relative surplus value, Marx expounded how the labor process moves from formal subsumption to real subsumption. Among them, formal subsumption means that capital occupies labor power and dominates labor results on the basis of the existing labor process; while real subsumption means that capital transforms the labor process itself through cooperation, division of labor and machine systems, so that workers' labor capacity, labor rhythm and labor organization forms all submit to the needs of capital proliferation. The "collective worker" is precisely the socialized labor subject formed in this process, and has the following inherent stipulations:

First, the expansion of labor subjects and the dissolution of boundaries. In the large-scale machine industry system, products are no longer the result of the direct labor of individual workers, but the product of the joint action of "combined labor personnel" (Kombiniertes Arbeitspersonal). The components of the collective worker include not only manual workers who directly participate in production activities, but also mental workers who indirectly participate in production activities, such as technicians, engineers, scientists and managers. As "local workers", they form an organic and functionally complementary whole under the organization of capital, and jointly complete the process of value creation.

Second, the deepening of real subsumption of labor to capital. Formal subsumption only means that the labor process is carried out under the supervision and domination of capitalists, while real subsumption means that the labor process itself is thoroughly transformed. Workers lose the possibility of completing products independently and can only play a role as a "part" in the capitalist production system. The originally complete labor skills and processes are simplified and decomposed into the assembly line through division of labor and cooperation, and workers become appendages of capital both in form and in essence.

Third, the continuation of the exchange relationship between labor and capital. Although the specific form of labor has changed, the abstract social attribute of the exchange between capital and labor has not changed. The key lies in whether workers are associated with capital and whether their labor directly creates surplus value for capital. Under the framework of the "collective worker", no matter how far the individual work is from the direct social production link, as long as its labor is a necessary link constituting the social total labor process and is employed labor, it belongs to the category of productive labor [5]. This is a theoretical basis for understanding subsequent digital labor and the "collective worker".

2.3. The evolution of the category of "collective worker" in the era of digital capitalism

2.3.1. Redefinition of theoretical tension: the debate over the boundaries of the "collective worker" in the digital age

The rise of digital capitalism has first triggered great controversies over the specific form and boundaries of labor. Hardt and Negri, representatives of the Italian Autonomist School, put forward the hegemony theory of "immaterial labor", arguing that productive labor in the digital age is no longer limited to the manufacture of material goods, but extends to the whole society, dominated by affective and intellectual labor. They hold that the "multitude" of workers becomes a subject with both productive and exploitative nature under the real subsumption of capital, and the boundaries of labor extend infinitely to all members of society. In contrast, Christian Fuchs, a scholar of political economy of communication, adheres to the material basis of Marx's labor theory of value and puts forward the overarching concept of "digital labor", arguing that "digital labor and digital laborers are all activities involving digital media technology and content production", including not only the free labor of users, but also the paid labor of full-time digital laborers. Fuchs regards the browsing, clicking and content posting of social media users as unpaid "audience labor", believing that users produce data which is then appropriated by platforms, thus constituting an exploitation relationship. Zhu Dongbo, Yang Jiguo and others approach from the perspective of artificial intelligence production, and clearly advocate that the only source of social wealth and value is the "living labor" of the "collective worker", and artificial intelligence is only a part of the "collective worker", which greatly expands the extension of "living labor" that creates value, but does not change the value source of "living labor" of the "collective worker". To sum up, the core of the "collective worker" is still workers who are directly or indirectly absorbed by capital and create surplus value on the production chain of digital commodities, but its cooperation chain is longer, its relations are more complex, and its concealment is stronger.

2.3.2. Reconstruction under algorithmic control: the paradox of integration and atomization

The core mechanism of the reconstruction of the collective worker by digital Taylorism lies in the highly fragmented integration of the labor process by algorithms. In the era of traditional industrial capital, the cooperation of the "collective worker" is mainly realized through the management system and strict discipline within the factory. In the era of digital capitalism, labor control dominated by algorithms emerges as the times require, and algorithms assume the triple roles of automated execution, division of labor guidance and real-time supervision. Scholars such as Buissink point out that digital labor platforms use algorithms as a "transmission mechanism" to convert managers' intentions into system instructions, constraints and incentives, and reconstruct an extremely efficient but asymmetric superior-subordinate relationship in virtual space. On the one hand, digital platforms integrate workers around the world to an unprecedented extent, enabling them to participate in cooperative social labor [6]. For example, Amazon's Mechanical Turk platform, the popular Uber ride-hailing system abroad, and domestic takeaway platforms led by Meituan and [Ele.me](Ele.me) match, schedule and coordinate millions of workers scattered in different geographical spaces in real time through algorithms, while enabling them to serve a unified commodity or service supply system. Socialized mass production exhibits extremely high labor productivity with the support of digital technology, and the "collective worker" also expands into a "digital collective worker" unprecedentedly in both time and space dimensions. On the other hand, macro integration is precisely based on and at the cost of extreme fragmentation and atomization at

the micro level. Algorithms decompose the complete labor process into countless standardized task units, which not only make workers' abilities more and more one-sided, but also cut off the horizontal interpersonal connections between workers. Workers can no longer assist each other in the workplace and form organized groups, but are reduced to "data nodes" that independently receive instructions, perform tasks and accept evaluations [7]. As atomized individuals, they can only directly face a "system" that can actively monitor and manage. Platforms use digital technology to reintegrate these scattered labors in time and space in virtual space. Almost the entire production process involves the participation of automated systems. Workers are isolated from each other during the production process, and they do not even know what the final product is, thus forming a new type of "combined labor". The social product created by this combined labor is the common product of the "digital collective worker", but its surplus value is appropriated by platform capital for free. This confirms Marx's insight that "the concepts of productive labor and productive worker must necessarily expand", and digital collective workers are also incorporated into the control of digital capitalism by a more refined and concealed form of algorithmic exploitation.

2.3.3. Objective integration and subjective disintegration of class structure

As a whole, the "collective worker" is integrated more closely than ever before in the global value chain, and its interdependence has reached an unprecedented height; but as individuals, they are more isolated and atomized than ever before, unable to form effective class identity and collective action capacity. This state of deep integration of the "collective" in objective structure and complete disintegration in subjective identity constitutes the core feature of class form in the digital age. Algorithms not only manage the labor process, but also constitute a powerful set of disorganization mechanisms, which cleverly shift labor-capital contradictions into contradictions between humans and technology, or between workers and consumers, greatly dispelling the emergence of class consciousness [8]. Therefore, the reconstruction of the category of "collective worker" in the era of digital capitalism is a profound transformation that occurs simultaneously in three dimensions: boundaries, cooperation modes and subject consciousness. Boundaries are redefined amid theoretical tensions, cooperation modes operate in the paradox of global integration and individual atomization, and class subjects undergo the dual fate of objective unification and subjective division mediated by algorithms.

3. Digital reconstruction: the "collective worker" under the reconstruction of digital taylorism

3.1. Connotation and characteristics of digital taylorism: algorithmic management, monitoring and discipline

The "Taylor system" refers to the systematic and scientific factory management method proposed by American engineer Taylor in the early 20th century, which was established for the purpose of improving labor productivity. In his article *The "Scientific" System of Squeezing Out Sweat*, Lenin commented that the Taylor system means squeezing twice as much labor from workers in the same working day as before. Compared with traditional Taylorism, digital Taylorism places more emphasis on the use of digital technology to carry out fine-grained decomposition, standardized control and real-time monitoring of the labor process. It inherits the core concept of scientific management of Taylorism in the early 20th century: decomposing the labor process into the simplest basic units and eliminating workers' autonomy. But in the era of digital capitalism, digital technology endows it with unprecedented monitoring capability and automation degree. Digital

Taylorism conducts real-time monitoring and analysis of workers' behaviors through intangible data and algorithms, and its control over workers even penetrates from the labor field to the life field. Under digital Taylorism, algorithms are both "supervisors" and "managers". Digital Taylorism presents three core characteristics: unification of labor tools, extreme simplification of operation processes and automation of discipline means [9]. The relationship between workers and labor conditions is reset, and human body and behavior data are continuously collected and fed back, forming a closed-loop control circuit. Digital Taylorism is not limited to the fixed places of traditional employed labor, but penetrates into the life world through smart phones, wearable devices and mobile Internet, converting life time into labor time and making "life as production" possible.

3.2. Reconstruction of the "collective worker" by digital taylorism

3.2.1. Reconstruction of time control

The control of time by the Taylor system is mainly reflected in the following three aspects: First, time control penetrates from fixed working hours to all time periods, and digital platforms break the fixed boundary of working hours. Workers in the gig economy seem to have the right to "freely choose working hours", but in fact, through dynamic pricing, incentive and punishment mechanisms, and requirements for order acceptance rates, algorithms drive workers to extend their online time on the platform [10]. For example, takeaway platforms use means such as peak-hour premiums, bad weather surcharges, and late-night delivery subsidies to "deprive" takeaway riders of their free time inadvertently, blurring the time line between work and rest. Secondly, the time scale is continuously compressed to micro-time. Algorithms realize the ability to regulate micro-time at the macro level, which is impossible in traditional Taylorism. In traditional industrial production, the speed of the assembly line limits the upper limit of workers' work efficiency; while digital platforms do not have this problem, and use real-time data and prediction algorithms to continuously adjust the task delivery frequency and time limit requirements for individual workers. The "estimated delivery time" of takeaway delivery is constantly compressed, and any short delay may trigger punishment. Workers have to be "exploited" by the highly tense tasks set by algorithms. This highly concealed form of exploitation makes workers' bodies and spirits alienated by algorithms without their knowledge, and even unconsciously fall into the exploitation trap woven by algorithms driven by capital in order to make a living. The extraction of surplus value extends from traditional concentrated working hours to the accumulation of continuous fragmented time [11]. Finally, the domination of time extends from current time to future time. The massive data collected by platforms is not only used for current task scheduling, but also for predicting workers' behavior patterns, loyalty and turnover risks, so as to take preventive measures and incorporate workers' historical time and future time into the labor process of producing surplus value. Workers' independent consciousness and time become objects of algorithmic prediction and manipulation, and their subjectivity is more thoroughly deprived. This reconstruction of control over time and even individual cognition makes the transformation of labor from formal subsumption to real subsumption to capital continue to deepen.

3.2.2. Reconstruction of spatial extension

In traditional Taylorism, the supervision and control of workers are mainly limited to fixed workplaces, and labor cooperation and monitoring are facilitated through physical concentration.

Digital Taylorism greatly extends the physical space of labor, from fixed workshops to the entire physical space and even virtual space. On the one hand, digital platforms turn urban space into a "social factory" as described by Italian scholar Tronti. Industries represented by takeaway, express delivery and ride-hailing rely on digital labor platforms, and weave various life scenes into a huge production network through digital maps, GPS positioning, mobile communication and other technologies. Each rider or driver is a moving node in this network. They carry out dynamic production in these spaces, and their real-time production status is monitored and guided by digital platforms in real time. Labor cooperation in this spatial form makes workers highly dispersed in physical space, highly concentrated in digital connections, and highly coordinated under algorithmic scheduling. On the other hand, digital technology creates virtual labor spaces, incorporating originally non-productive online activities into value creation links [12]. Users' content posting, browsing, interaction, and even emotional expression on social platforms have all become "digital labor" required for generating data, training algorithms and attracting advertisements. These activities are distributed on hundreds of millions of individual terminals, but are aggregated into total labor by platforms, and users themselves become part of the digital collective worker. This process realizes the extreme concealment and popularization of labor space, and greatly expands the spatial field for capital to extract surplus value. As a result, the composition of the collective worker is unprecedentedly extended geographically, including digital workers and Internet users distributed all over the world, who form a "global collective worker" in virtual space through the Internet. But the combination of this collective worker is not due to the voluntary association of workers, but completely organized and controlled by a small number of digital capital platforms. The concealment and extensiveness of this control are precisely the core characteristics of the spatial reconstruction of digital Taylorism.

3.2.3. Fragmentation and reintegration of the labor process: the formation mechanism of the digital collective worker

The most core mechanism of the reconstruction of the collective worker by digital Taylorism is the high degree of fragmentation of the labor process, which is then reintegrated through digital platforms, thus forming a "digital collective worker" at a new level. Under digital capitalism, work traditionally completed within a certain occupation or enterprise is dismantled into minimal task units by platforms. For example, traditional programming projects can be decomposed into micro-tasks such as interface design, front-end development, back-end development and testing, which are distributed to gig workers with different skills around the world through crowdsourcing platforms; large-scale data annotation projects split millions of image and text labeling tasks into one-click operations, which are completed by countless low-income workers on web pages or apps. These local workers only need to perform extremely single operations, and their labor is extremely one-sided, just like the modern version of local workers in manufacture [13]. Each digital worker is just an "organ" of the digital collective worker, performing a certain function assigned by the algorithm. Platforms use algorithms and software systems to reintegrate these extremely scattered and one-sided labors in digital space. Task decomposition, distribution, tracking, quality evaluation and remuneration payment are all realized automatically by the system. During the process, workers do not meet each other, and even do not know what the final product is. Thus, we witness the formation of a huge group of "digital collective workers" within the category of "collective workers", which includes various types of laborers active on digital platforms, traditional service industry practitioners driven by algorithmic management, Internet users engaged in data production, and even "cognitive workers" who provide creative content and solutions... Although their labor methods are

different, they all perform their local functions in digital capitalist production and constitute the total organ of the capital proliferation system.

4. Analysis of the fundamental contradiction of capitalism behind the reconstruction of the "collective worker" by digital Taylorism

4.1. Digital deepening of the contradiction between the socialization of production and the private ownership of the means of production

The reconstruction of the collective worker by digital Taylorism not only brings about changes in the organizational form of the labor process, but also more profoundly reflects the intensification of the fundamental contradiction of capitalism in the digital age.

The development of digital technology has brought the socialization of production to an unprecedented height. The global economy is linked by digital technology into an instant interactive whole. All links of R&D, design, production, logistics and consumption are highly coordinated on a global scale, and the production and sharing of knowledge and information are increasingly socialized. The formation of the digital collective worker is precisely the concentrated embodiment of this socialization: the cooperation of countless workers is organized by large platforms, producing huge digital social products. Whether it is transportation networks, e-commerce logistics systems or artificial intelligence models, they are all products of socialized mass production. However, this highly socialized productive force is privately owned and controlled by a few digital capital giants. Search engines, social media, cloud computing, algorithms of logistics platforms, data sets, user networks, and technology ecosystems constitute the core means of production in modern times. By virtue of the monopolistic ownership of these digital means of production, platform capital appropriates the surplus value produced by the cooperation of digital collective workers for free. This is precisely the latest manifestation of the fundamental contradiction of capitalist society, "the contradiction between the socialization of production and the private ownership of the means of production". Digitalization makes the division of labor and cooperation in socialized mass production continue to deepen, and the more public and dependent social products are, the sharper the contradiction of their appropriation by private capital becomes.

4.2. Real subsumption of labor by capital and new forms of alienation

Marx distinguished between formal and real subsumption of labor to capital. Under formal subsumption, the labor process has not undergone fundamental changes, and capital only extends labor time externally to extract absolute surplus value; under real subsumption, capital thoroughly transforms the labor process itself, making it an internal link of capital proliferation — digital Taylorism precisely promotes the real subsumption of labor by capital to a new stage. Algorithmic management makes workers' skills, knowledge and experience externalized as part of the digital system. Taking ride-hailing drivers as an example, core skills such as route finding, bargaining and customer communication are replaced by apps, and drivers only need to execute algorithmic instructions, with their subjectivity suspended by the system [14]. In a broader scope, artificial intelligence and automation are absorbing the general intellect accumulated by a large amount of human labor, converting workers' cognitive abilities into attributes of machines, and workers become "conscious organs" incorporated into the digital machine system. On the surface, digital collective workers participate in complex social cooperation, but in fact their labor is extremely simplified and fragmented, becoming replaceable parts at any time, which makes workers more

dependent on the technical system controlled by capital than before [15]. In this process, alienation takes a more advanced and concealed form. Under digital interfaces and algorithmic incentives, workers often experience an illusion of "self-exploitation". They think they are using platforms for flexible employment, but in fact they are deeply manipulated by the gamified design, reputation system and irregular incentives of platforms. This reified consciousness makes it difficult for workers to recognize their class status as digital collective workers as a whole, thus weakening the possibility of collective resistance.

5. Path of transcendence: digital labor governance under the socialist system with Chinese characteristics

The reconstruction of the collective worker by digital Taylorism has brought many accompanying negative effects. Although it has the appearance of technological neutrality and efficiency improvement, and improves production and service efficiency with advanced algorithms, it essentially strengthens the actual control of capital over the labor process through technical means, and extends surplus labor time, increases labor intensity, lowers labor remuneration and shifts labor costs in a more concealed way. This is undoubtedly a profound manifestation of the essence of capital contradictions revealed in *Capital* — it not only has the civilized aspect of promoting the development of productive forces, but also makes this development manifest as the extraction of workers' power. Therefore, the critique of digital Taylorism must return to Marx's political economy critique paradigm, and find the real driving force to transcend digital Taylorism and emancipate the collective worker in the practice of socialism with Chinese characteristics.

5.1. Driving high-quality development with new-quality productive forces

To transcend digital Taylorism, first of all, we must lay a solid material foundation at the level of productive forces. The deep integration of digital technology with the three elements of productive forces has given birth to "new-quality productive forces" characterized by digitalization and intelligence. New-quality productive forces are not only manifested as a leap in labor productivity, reflecting the liberation of the social attribute of productive forces, but more importantly, they contain the historical possibility of liberating "general intellect" from the logic of capital proliferation and returning it to its "social nature". The key for socialism with Chinese characteristics to achieve transcendence at the level of productive forces lies in guiding the development direction of digital productive forces with the socialist system: making full use of digital technology and capital, promoting scientific and technological innovation to cultivate new-quality productive forces, promoting a substantial increase in total factor productivity, ensuring that the fruits of development are shared by the people while improving production efficiency, promoting the liberation of free time, and at the same time anchoring the goal of productive forces development to meeting the people's ever-growing needs for a better life, rather than to the logic of infinite capital proliferation [16]. The Report to the 20th National Congress of the Communist Party of China points out that for the development of the digital economy, on the basis of the development of the real economy, we should "promote the deep integration of the digital economy and the real economy". This development direction helps to avoid the virtualization bubble of the digital economy and ensures that digital technology serves the real economy and people's well-being. At the global level, we should strengthen international cooperation in digital governance and build a digital community with a shared future. The global flow of digital capital requires digital governance to transcend national boundaries and form an internationally coordinated governance framework to jointly

address global challenges such as the digital divide, data security and algorithmic ethics. The Global Data Security Initiative proposed by China provides an important basis for strengthening international cooperation in digital governance. Developing countries should work together to promote a more just and reasonable global digital governance system, break the technological monopoly of digital oligarchs, and ensure that all countries enjoy equal opportunities for digital development. We should strengthen technology transfer and capacity building support to help developing countries improve digital literacy and digital innovation capabilities [17].

5.2. Taming digital capital with the basic socialist economic system

The core feature of digital capitalism lies in that the productive forces created by digital technology are monopolized and possessed by capital, and the ownership of the means of production and its derivative relations determine the inequality of distribution. To solve the internal contradictions of the capitalist mode of production in the digital age, we must fundamentally change the ownership of the means of production and its derivative relations, and realize the socialist application of digital technology. The transcendence path of socialism with Chinese characteristics at the level of production relations is concentrated in the taming and regulation of digital capital with the basic socialist economic system as the framework.

Socialism with Chinese characteristics adheres to the basic economic system with public ownership as the main body and diverse forms of ownership developing together, ensuring that digital infrastructure and key data resources are in the hands of the state and the people; preventing digital capital from forming monopolistic control, and promoting the co-creation and sharing of digital economic development achievements. By improving the income distribution system, we regulate the benefit distribution mechanism of digital platforms, protect the legitimate rights and interests of digital workers, and narrow the income gap caused by digital technology.

The socialist market economic system not only gives play to the productive function of capital, but also actively takes measures to prevent the infinite expansion of capital and guide the healthy development of capital. This means "creative taming" of digital capital — not only recognizing its positive role in developing productive forces, but also constraining it on the track of serving the overall interests of society through institutional design. In the final analysis, it is the socialist system that sublates and transcends the paradox of digital technology capitalization: giving play to institutional advantages to transcend the paradox of rich and poor brought by digital technology capitalization, fully grasping the law of capital operation in the socialist market economy, optimizing the market environment, and establishing a market mechanism for fair competition. In addition, at the level of production relations, we also need to actively explore the property right system of data factors, establish and improve new-type property right arrangements adapted to the development of digital productive forces, so that the creators and contributors of data factors can fairly participate in benefit distribution, and fundamentally break away from "digital commodity fetishism". We will establish and improve the legal and regulatory system for the operation of digital capital to prevent the disorderly expansion of capital and data monopoly. In capitalist production relations, the development of digital technology deviates from its true value and is dominated by capital; while China has clearly defined the operating boundaries of digital capital through a series of legislations such as the revision of the Anti-Monopoly Law, the Data Security Law and the Personal Information Protection Law, unifying "capital going to the countryside" and "capital abiding by boundaries". Establishing and improving the digital labor rights and interests protection system, and improving the social security, working hours and labor protection mechanisms for platform employment are important contents of transcending digital capitalism at the institutional

level. Adhering to the socialist application of digital technology, and guiding digital technology to serve national strategies and people's livelihood needs rather than simply serving capital proliferation through the reform of the scientific and technological innovation system and mechanism. The fundamental purpose of institutional construction is to make digital technology "return to its essence as a tool to promote individual freedom and all-round development".

5.3. Transformation from digital collective worker to digital community

Under the conditions of digital capitalism, human beings are alienated by data and algorithms controlled by capital logic, workers become appendages of the digital production system, and human freedom and subjectivity are seriously eroded. Digital technology provides conditions for enriching people's spiritual and material life, but human life "has degenerated into an appendage of digital technology". This is the deep paradox of digital capitalism: technological progress and human alienation intensify simultaneously, which also constitutes the root of the collective worker's digital exploitation. Therefore, to achieve the practical transcendence of digital Taylorism, we must base ourselves on historical materialism, return to the core of "real people", and transcend capital logic with human-centered logic.

The emancipation of digital labor from the perspective of Marxism must return to the core of "real people". First, guide the development direction of digital technology with human-centered logic. Under the dominance of human-centered logic, technical tools such as artificial intelligence are no longer means for capital to enslave people, but tools for emancipating people. Under the dominance of human-centered logic, all workers not only own all the means of production, but also demonstrate their own subjectivity in the labor process and own all labor products. Digital technology can give full play to its technical advantages to promote the leapfrog development of productive forces, but the starting point and foothold of technological innovation must be human needs rather than capital proliferation needs. Second, create material and time conditions for free labor. Marx believed that real wealth is disposable free time. The digital economy under the socialist system can consciously use automation and intelligent technology to shorten the necessary labor time of society and increase people's free development time, so that labor can be transformed from a means of making a living into the first need of life. This is the exact opposite of digital Taylorism's practice of turning all time into labor time [18]. China's exploration in promoting artificial intelligence ethics, anti-platform monopoly and protecting the rights and interests of workers in new forms of employment is a preliminary attempt to achieve this step. Ultimately, the fundamental goal of transcending digital Taylorism points to the all-round free development of human beings. The future society that Marx envisioned in criticizing capitalism is a "form of society based on the free and all-round development of each individual as the basic principle". In the discourse of socialist political economy with Chinese characteristics, this is embodied in the people-centered development thought and the grand goal of common prosperity. These practical directions have already sprouted in policies such as China's digital economy governance, standardized development of platform economy, and protection of workers' rights and interests in new forms of employment [19]. Only by adhering to the guidance of Marxist political economy, revealing the exploitative essence of digital Taylorism, and giving play to the institutional advantages of socialism with Chinese characteristics, can we blaze a new path in the digital wave that is truly conducive to the emancipation of workers and the all-round development of human beings.

6. Conclusion

Marx's critique of political economy has never been purely theoretical speculation, but points to the revolutionary transformation of capitalist production relations. The fundamental way out of transcending digital Taylorism lies not in technical patching or improvement, but in changing the ownership of the means of production and its derivative production relations, so that the development of digital technology shifts from serving capital proliferation to serving the free and all-round development of human beings. Through institutional construction, value guidance and path innovation, socialism with Chinese characteristics has opened up a realistic path of transition to digital socialism under the realistic condition of "coexisting with capital", and initially opened up a realistic path of gradually sublating digital Taylorism and promoting the transformation from "digital collective worker" to "digital community" under the realistic condition of "coexisting with capital". However, transcending digital Taylorism is a long historical process full of contradictions. The capitalist mode of production still has considerable vitality and adaptability at present, and the iterative evolution of digital technology changes the power balance between labor and capital in a non-linear manner. Therefore, the theoretical and practical path to digital socialism is not a utopian ultimate solution, but explores the possible direction of labor emancipation in the digital age under the premise of fully recognizing realistic constraints and guided by the critical spirit of Marxist political economy.

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