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Platform Oligopoly and Data Feudalization under the Perspective of Technological Sovereignty

-- Research on the Realization of Socialist Public Ownership

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ABSTRACT

As a core element in safeguarding national sovereignty, "technological sovereignty" has evolved into technological feudalism through its exclusivity in the digital era, specifically manifested as a market pattern of platform oligopolies. Data feudalization serves as the hallmark feature of this phenomenon. Grounded in Marxist monopoly theory and technological sovereignty, this paper systematically analyzes the formation mechanisms of platform oligopoly and the typical characteristics of "data feudalization," exploring their challenges and implications for realizing socialist public ownership in the digital economy. The study reveals that platform capital constructs new monopolistic forms through data possession, algorithmic control, and ecosystem closure - essentially perpetuating the logic of capital expansion. Meanwhile, "data feudalization" exacerbates digital economy inequality via data privatization and labor alienation. From an international comparative perspective, this paper proposes transforming platform economies from commercial market logic to social logic through socialist ownership-based approaches: market-oriented allocation of data elements, public ownership of digital infrastructure, and innovation in antitrust legal frameworks. This transformation ultimately achieves a dynamic equilibrium between technological sovereignty and public interests.

KEYWORDS

Technological Sovereignty; Platform Oligopoly; Data Feudalization; Marxist Monopoly Theory; Socialist Public Ownership.

1. ANALYSIS OF PLATFORM OLIGOPOLY

1.1. Platform Oligopoly Principle

The formation logic of platform oligopolies in the digital era essentially represents a new manifestation of the contradiction between capital accumulation and competition within the digital economy. Marx pointed out in *Das Kapital* that the essence of capitalist competition is "the life-and-death struggle among capitals" [1]. Competition compels capitalists to continuously expand production scale to reduce costs, leading to "the concentration of production and capital." When concentration reaches a certain level, "a few enterprises inevitably form monopoly agreements to avoid mutual destruction." In Volume III of *Das Kapital*, he emphasized: "Monopoly grows from the capitalist mode of production itself," being an inevitable outcome of capital accumulation. Lenin further noted that "the deepest economic foundation of imperialism lies in monopoly," which "grows from capitalism and exists within its general environment" [2], summarizing five characteristics of

monopolies: production concentration leading to monopoly, the fusion of banking and industrial capital into financial capital, capital export, formation of international monopoly alliances, and territorial division. Lenin particularly stressed that monopolies lead to "decadent tendencies," where monopoly enterprises maintain profits by restricting mass production and obstructing technological progress.

In the digital economy era, the logic of capital accumulation and competition has evolved into new forms. Platform companies 'production resources now extend beyond traditional factories and machinery to encompass digital infrastructure such as data, algorithms, and computing power. As the core production factor in the digital economy, data exhibits non-rivalrous and increasing returns to scale characteristics, leading to a "winner-takes-all" competitive landscape among platform enterprises. As Cedric Dielen noted in *Techno-Feudalism*: "Advancements in information technology have significantly reduced the costs of replicating, processing, and disseminating information, thereby fueling the rise of' intangible capital' concentrated in the highest-profit segments of global value chains, which serves as a key driver for platform oligopolies" [3]. For instance, when choosing social platforms, users tend to prioritize those with larger user bases and richer social networks. This "network effect" enables early-stage platforms that accumulate users to rapidly gain competitive advantages. Through continuous data collection and algorithm optimization, they further consolidate market dominance, ultimately forming an oligopoly.

1.2. Platform Oligopoly is Typical

1.2.1. High Market Concentration

In the world's major digital markets, platform oligopolies have highly concentrated market shares, with a few companies occupying the majority of the market. Taking the global search engine market as an example, Google has maintained a market share above 90% for a long time, while Baidu's market share in the China market also exceeds 70%. In the global mobile app store market, Apple's AppStore and Google's Google Play collectively account for over 95% of the market share. In the global cloud computing market, Amazon AWS, Microsoft Azure, and Google Cloud collectively hold more than 60% of the market share. This highly concentrated market share enables platform oligopolies to dominate market prices, set industry rules, and create extremely high entry barriers for new entrants.

1.2.2. Algorithmic Collusion and Price Monopoly

Platform monopolies achieve price control through algorithmic collusion, representing a new manifestation of monopolistic behavior in the digital age. Unlike traditional price-fixing methods that relied on secret agreements or verbal contracts between companies, modern digital platforms employ algorithmic analysis to monitor market data and competitors 'pricing strategies, enabling automatic adjustments that create "hidden collusion". For instance, on e-commerce platforms, merchants use third-party pricing software to track rivals' prices in real-time and automatically adjust their own product prices. This mechanism maintains artificially high market prices, ultimately harming consumer interests.

1.2.3. Ecological Closure and Exclusive Competition

Platform monopolies maintain dominance by creating exclusive digital ecosystems through exclusionary competition strategies. For example, Apple's iOS prohibits users from installing apps through non-AppStore channels and requires developers to exclusively use its payment system, threatening to remove apps from the platform otherwise. These exclusionary measures not only restrict developers' options but also block competitors from entering Apple's ecosystem, thereby solidifying its monopoly in app distribution and payment services.

1.2.4. Data Monopoly and Data Barriers

Platform monopolies establish data dominance and barriers by controlling massive user datasets, restricting the free flow and sharing of information. As the core production factor in the digital economy, data value grows exponentially with expanded usage. These dominant players build extensive databases through collecting behavioral patterns, social interactions, and consumption histories, then leverage algorithmic analysis to extract value for their operations. New entrants, lacking sufficient data accumulation, struggle to develop competitive products and services, ultimately failing to challenge the established market dominance.

1.3. The Formation Mechanism of Platform Oligopoly

1.3.1. Self-reinforcement of Network Effects

Network effects constitute a core mechanism in shaping platform oligopolies. This phenomenon describes how the value of products or services grows exponentially with increasing user numbers. As Stan Harrison noted: "Tech giants in the digital age have transformed internet platforms into a 'new frontier' in cyberspace, establishing a feudal-like 'digital tenant system' that relies on network effects as its cornerstone" [4]. In the digital economy, network effects demonstrate that platforms gain greater value through expanding user bases, which subsequently attracts more users, creating a self-reinforcing virtuous cycle.

1.3.2. Economies of Scale and Scope

Platform companies exhibit pronounced economies of scale and scope, which serve as key mechanisms for establishing oligopolistic dominance. Economies of scale refer to the continuous reduction in unit costs as production scales expand, while economies of scope occur when combined production of multiple products or services yields lower costs than producing each item separately. In the digital economy, platform enterprises face higher fixed costs such as R&D investments and server infrastructure, but benefit from lower variable costs per user acquired. As user numbers grow, these fixed costs are distributed across a larger user base, leading to decreasing unit costs and ultimately achieving scale economies.

1.3.3. Technical Barriers and Patent Monopoly

Platform monopolies restrict competition from new entrants by establishing technical barriers and patent monopolies. The digital economy requires substantial investment in R&D and talent, creating extremely high technical thresholds. Leveraging their financial strength and talent advantages, these platforms can sustain technological innovation, develop cutting-edge products and services, thereby forming technical barriers. For instance, Google has invested heavily in search engine technology and artificial intelligence research, securing numerous core patents that make it difficult for competitors to match its technological edge.

1.3.4. Lagging Policy and Regulation

The lag in policy development and regulatory frameworks has created conditions for platform monopolies to emerge. As a rapidly evolving economic model, the digital economy outpaces traditional sectors in growth momentum, yet its governance mechanisms remain underdeveloped. For instance, conventional antitrust laws struggle to effectively address monopolistic practices by platform giants such as algorithmic collusion, data-driven price discrimination, and ecosystem exclusivity. While traditional regulations primarily target industrial monopolies like price fixing and bundled sales, they lack clear definitions and enforcement measures for emerging digital monopolistic behaviors including algorithmic coordination and data control.

2. ANALYSIS OF DATA FEUDALISM

2.1. The Conceptual Definition of Data De-facto

"Data Feudalism" represents a novel economic paradigm emerging in the digital age, originating from technological feudalism. In traditional feudal societies, feudal lords exploited and dominated peasants by controlling land - the core means of production. Similarly, in the digital era, platform monopolies exploit and control digital workers through data - the essential production factor - forming an economic relationship akin to traditional feudalism: "data feudalism."

2.2. Typical Features of Data De-facto

2.2.1. Data Privatization and Exclusivity

Platform monopolies exploit various mechanisms to convert user-generated data into private property, monopolizing both ownership and usage rights. In the digital economy era, users generate massive amounts of data while using platform services - including browsing history, search records, social content, and purchase histories. These digital footprints represent users' labor achievements, yet their ownership is hijacked by platform giants through user agreements. For instance, when registering for a social media account, users must agree to platform terms that typically stipulate content uploads are owned by the platform, granting it exclusive rights to use, modify, and distribute such materials.

2.2.2. Digital Labor Alienation and Exploitation

Digital labor alienation stands as a defining characteristic of data feudalization. In the digital economy era, users unconsciously engage in digital labor while using platform services, including browsing information, publishing content, sharing data, and participating in interactions. Although these activities appear voluntary, they are essentially labor processes designed by platform oligopolies to extract data. By collecting, analyzing, and monetizing these digital outputs, platform operators convert them into commercial value without compensating users—a disconnect between labor and reward that constitutes digital labor alienation. Wei Xu's critique in *The Value Production, Measurement, and Distribution Under Digital Capitalism: A Critique of the "Lack of Value Law" Theory* states: "So-called' free digital labor' by users does not qualify as general productive labor, nor even constitutes true labor, and thus cannot create value" [5]. While challenging the notion of value creation through digital labor, this perspective indirectly reveals the phenomenon of digital labor alienation: the disconnection between user effort and its corresponding value returns.

2.2.3. Digital Hierarchies and Inequality

Platform oligarchs leverage their data and technological dominance to establish an unequal digital hierarchy. At the apex of this system are platform giants that control data ownership and governance, dictating rules for the digital economy and steering market trends. Businesses and developers in the middle tier depend on platform resources like user traffic, data support, and technical services, thus being required to comply with regulations and pay fees including commissions, advertising costs, and service charges. Ordinary users form the base layer-data creators who lack ownership rights yet passively accept services while enduring exploitation. As Joel Kotkin notes in *The Coming of Neo-Feudalism: A Warning to the Global Middle Class*: "Many low-status workers are becoming the so-called 'vulnerable class,' gradually shifting from high-skilled industries and services to roles like personal assistants and domestic helpers, occupying the 'lower strata' of the digital pyramid" [6]. This vividly illustrates the class stratification and inequality inherent in the digital hierarchy.

2.2.4. Data Enclosure and Monopoly

The data enclosure movement epitomizes the feudalization of information resources. In traditional feudal societies, lords exploited peasants by seizing land and controlling resources. Similarly, in the digital economy era, platform monopolists dominate data domains through strategic maneuvers,

creating information monopolies that mirror historical land-grabbing practices. This phenomenon has thus been dubbed the "data enclosure movement".

Through data enclosure campaigns, platform oligopolies have amassed vast amounts of premium data resources, establishing data monopolies. Such monopolistic practices not only restrict the market-oriented allocation of data elements but also hinder the development of competing enterprises. New entrants, lacking sufficient data accumulation, struggle to develop competitive products and services, thereby failing to break through the monopoly dominance of platform oligopolies. Hu Ying, in her critique "Critical Analysis of American Digital Hegemony from the Perspective of Digital Imperialism," observes: "Tech giants controlling digital technologies are gradually transforming open, shared cyberspace into exclusive private domains. By building digital economy ecosystems, they aggressively expand their data territories, achieving predatory appropriation of data resources - a concrete manifestation of the data enclosure movement" [7].

2.3. The Formation Mechanism of Data Dematerialization

2.3.1. The Particularity of Data as a Factor of Production

In his book *Platform Capitalism*, Nick Szolnitsky observes: "Advertisers seek not fragmented data, but insights into consumer needs and targeted audience matching. These are already analyzed data, where the scale effect allows platforms to better serve advertisers' demands, thereby reinforcing their data monopoly" [8]. As a core production factor in the digital economy, data possesses three key characteristics: non-rivalry (multiple users can coexist without diminishing value), non-excludability (once generated, data becomes irreplaceable), and increasing returns to scale (value grows proportionally with usage). This trio creates conditions for data feudalization.

2.3.2. The Nature of Capital to Profit and Expand

The essence of capital lies in maximizing surplus value. In the digital economy era, data has become the new vehicle for capital to extract surplus value. As representatives of capital, platform oligarchs inevitably exploit digital labor through various means to acquire data resources and achieve rapid accumulation and expansion. David Harvey noted in *New Imperialism*: "Expropriative accumulation often sacrifices public interests, driving wealth transfer from the lower to upper classes. The capital expansion of platform oligarchs exemplifies this expropriative accumulation in the digital age, exacerbating data feudalization" [9]. This profit-driven nature of capital perpetuates the continuous acquisition of data resources and exploitation of digital labor by platform oligarchs, thereby accelerating the formation and development of data feudalization.

2.3.3. The Concealment and Non-payment of Digital Labor

The covert and unpaid nature of digital labor is a key factor contributing to data feudalization. As noted in Volume 8 of the Collected Works of Marx and Engels: "Proactive, creative activities constitute productive labor, whereas much user-generated digital work lacks this characteristic. This allows platform oligarchs to more readily label it as non-labor activity, thereby appropriating the fruits of labor without compensation.[10]" In the digital economy era, users unconsciously engage in digital labor while using platform services, yet these efforts are often concealed by platform operators, leaving users unaware of their own contributions.

2.3.4. Lack of Policy and Legal Regulation

In his book *The Medieval Internet: Power, Politics and Participation in the Digital Age*, Jacob Lina Jensen observes: "The digital era has created an 'asymmetric dependency between users and platforms, accompanied by escalating user monitoring.' The absence of robust policy frameworks and legal oversight has further exacerbated this imbalance, facilitating the formation of data feudalism" [11]. Within the digital economy, as data emerges as a novel production factor, its regulatory framework remains underdeveloped. Critical gaps persist: unclear legal provisions governing data ownership,

usage rights, and revenue entitlements; undefined legal boundaries for protecting digital labor; and ineffective enforcement of traditional antitrust laws against platform monopolies' data control practices.

3. THE REALIZATION PATH OF SOCIALIST PUBLIC OWNERSHIP IN THE FIELD OF DIGITAL ECONOMY

3.1. We Will Promote Market-based Allocation of Data Factors and Make Them Public

3.1.1. Establish and Improve the Data Property Rights System

Clarifying the ownership, usage rights, and revenue rights of data is fundamental to achieving public ownership of data elements. In her book *Preventing Digital Feudalism*, Mariana Mazucato emphasizes: "Governments should play a pivotal role in fostering innovation and guiding growth by coordinating public-private partnerships, creating market environments that incentivize genuine value creation while curbing value capture. Establishing robust data property rights systems serves as a crucial pathway for governments to fulfill this mission" [12]. It is essential to develop comprehensive data property rights frameworks that grant users ownership of their generated data, while platform companies retain limited usage rights only with user authorization. Concurrently, establishing data property rights trading markets would enable users to monetize their data assets through transactions, thereby achieving market-oriented allocation of data elements.

3.1.2. Strengthen Data Openness and Sharing

Breaking the data monopoly of platform oligopolies and promoting the free flow and sharing of data are key to achieving public ownership of data elements. In his work *How to Think About Global Digital Capitalism? -- Philosophical Reflections Under Contemporary Social Criticism*, Lan Jiang states: "However splendid the myth of digital capital may appear, it will inevitably collapse. Strengthening data openness and sharing, and realizing the public ownership of data elements, are crucial measures to prevent this myth from shattering" [13]. Governments should enhance the openness and sharing of official data by establishing open platforms that provide public data held by government agencies to enterprises and individuals for free use. Simultaneously, corporate data sharing should be promoted through policy guidance and legal regulations, requiring platform companies to share non-sensitive data with society or engage in data exchanges with other enterprises.

3.1.3. Improve the Data Supervision System

In his book *Overly Smart*, Jason Sardofsky argues: "With the implementation of sophisticated data monitoring comes the power to modify user behavior. Establishing robust data governance frameworks can regulate this authority, prevent platform companies from abusing their surveillance capabilities, and ensure the realization of public ownership of data elements" [14]. Strengthening oversight over data collection, storage, analysis, and utilization serves as a safeguard for achieving public ownership of data elements. It is crucial to develop comprehensive data regulatory systems that clarify supervisory bodies and responsibilities, enhance monitoring of platform enterprises 'data practices, and prevent them from exploiting data advantages through monopolistic or exploitative behaviors. Concurrently, intensified data security regulations must be implemented to protect users' privacy and safeguard data integrity.

3.2. We Will Promote the Public Ownership of Digital Infrastructure and Ensure Fair Use of Digital Infrastructure

3.2.1. Strengthening State-owned Digital Infrastructure

Increasing investment in state-owned digital infrastructure development and building an autonomous, controllable digital infrastructure system form the foundation for achieving public ownership of digital infrastructure. As noted in Volume 7 of The Collected Works of Marx and Engels: "Profit and rent are merely two categories of surplus value differentiated by whether it belongs to capital or land ownership. The operation of state-owned digital infrastructure enterprises can avoid the pursuit of profit maximization and better serve public interests" [15]. It is crucial to strengthen R&D and construction of key digital infrastructure such as operating systems, app stores, cloud computing services, and big data centers, thereby enhancing the technical capabilities and service quality of state-owned digital infrastructure.

3.2.2. Breaking up the Digital Infrastructure Monopoly

The key to achieving public ownership of digital infrastructure lies in policy guidance and legal regulation to break platform oligopolies' monopolies. We should strengthen oversight of digital infrastructure monopolistic practices by platform giants, prohibiting companies from implementing closed ecosystems and exclusive competition tactics to promote open sharing of digital resources. Simultaneously, we must encourage other enterprises to participate in the construction and operation of digital infrastructure, fostering a diversified supply system. Antitrust laws should prohibit platforms from restricting competition through bundled sales or exclusionary agreements in the digital infrastructure sector.

3.2.3. Improve the Standard System of Digital Infrastructure

In his book *Platform Capitalism*, Nick Szolnissik observes: "A platform is a new type of company whose ownership fundamentally resides in software rights, with its core mission being the pursuit of surplus value. Establishing a comprehensive digital infrastructure standards system can regulate platform enterprises' behavior and prevent their profit-driven objectives from harming public interests" [16]. Building a robust digital infrastructure standards framework serves as the foundation for ensuring equitable access to digital resources. It is essential to develop unified technical, service, and security standards for digital infrastructure, guaranteeing compatibility and interoperability across different systems.

3.3. Establish a Sharing Mechanism for the Fruits of Digital Labor to Eliminate Alienation and Exploitation of Digital Labor

3.3.1. Define and Protect Digital Labor

In his article "Critique of the 'Lack of Value Law' Theory on Value Production, Measurement and Distribution in Digital Capitalism --," Wei Xu argues: "So-called users " free digital labor 'does not constitute general productive labor, nor can it even be considered labor, and thus cannot create value. Clarifying the definition and protection of digital labor can rectify this perspective, ensuring that digital workers' efforts receive recognition and compensation." He advocates establishing legal frameworks to define digital labor standards, incorporating user activities such as information browsing, content creation, data sharing, and interactive participation into the scope of digital labor, thereby granting them legal protection.

3.3.2. Establish a Digital Labor Remuneration Distribution System

Volume 5 of the Collected Works of Marx and Engels notes that producing surplus value or exploiting surplus labor constitutes the inherent nature and purpose of capitalist production. Establishing a fair compensation system for digital workers can transform this dynamic, ensuring they receive their due

share of surplus value. Creating a reasonable compensation framework for digital labor is crucial for achieving equitable sharing of its fruits. Compensation should be determined based on both the quantity and quality of digital work, guaranteeing that digital laborers fully benefit from the value created through their efforts.

3.3.3. Promote the Development of Digital Labor Cooperatives

We should encourage digital workers to establish digital labor cooperatives, enabling them to participate in the digital economy through collective collaboration and share the fruits of their work. These cooperatives must provide essential support including technical assistance, training programs, and rights protection services to help workers enhance their skills and safeguard their interests. Furthermore, they should actively negotiate with platform companies to secure better working conditions and fair compensation packages for digital laborers.

4. CONCLUSION

In conclusion, the "data feudalization" resulting from the intertwining of technological sovereignty and platform monopolies has jeopardized fairness and justice in the digital age. Only within the framework of socialist public ownership can we establish institutional arrangements that ensure data is collectively owned by all citizens, infrastructure remains publicly managed, and algorithms are collaboratively governed. This transformation will shift the market empire's winner-takes-all model into a digital community where everyone shares resources, ultimately achieving harmony between technological sovereignty and people's sovereignty.

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