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Digital goods and the "value paradox": An approach from Marxist political economy

Bens digitais e o "paradoxo do valor": uma abordagem da economia política marxista

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ABSTRACT

This article analyzes the "value paradox" of digital goods, the phenomenon of marginal reproduction costs approaching zero, but market prices remain high within the framework of Marxist political economy. While neoclassical economics predicts that prices will tend to be close to zero under conditions of perfect competition and infinite replication, digital market practice suggests a proprietary pricing trend, creating a significant theoretical gap. The study argues that current approaches, including neoclassical theory and some research directions on digital labor, do not clearly distinguish between data, labor, and goods, and tend to equate value with price. On the basis of this critique, the paper proposes a new analytical framework, distinguishing between raw data, digital production materials, and complete digital goods. By means of dialectical materialism, the study demonstrates that the value of digital goods is still based on the social labor required, while prices are increasingly dominated by technological monopoly structures. The concept of "technological monopoly" is proposed to explain this pricing mechanism, thereby contributing to the development of critical theory of contemporary digital capitalism.

KEYWORDS: Digital goods, value paradox, labor value theory, Marxist monopoly price, Marxist political economy

RESUMO:

Este artigo analisa o "paradoxo do valor" dos bens digitais, o fenômeno em que os custos marginais de reprodução se aproximam de zero, mas os preços de mercado permanecem altos, dentro da estrutura da economia política marxista. Enquanto a economia neoclássica prevê que os preços tenderão a ser próximos de zero em condições de concorrência perfeita e replicação infinita, a prática do mercado digital sugere uma tendência de precificação proprietária, criando uma lacuna teórica significativa. O estudo argumenta que as abordagens atuais, incluindo a teoria neoclássica e algumas linhas de pesquisa sobre trabalho digital, não distinguem claramente entre dados, trabalho e bens, e tendem a equiparar valor a preço. Com base nessa crítica, o artigo propõe uma nova estrutura analítica, distinguindo entre dados brutos, materiais de produção digital e bens digitais completos. Por meio do materialismo dialético, o estudo demonstra que o valor dos bens digitais ainda se baseia no trabalho social exigido, enquanto os preços são cada vez mais dominados por estruturas de monopólio tecnológico. O conceito de "monopólio tecnológico" é proposto para explicar esse mecanismo de precificação, contribuindo assim para o desenvolvimento da teoria crítica do capitalismo digital contemporâneo.

PALAVRAS-CHAVE: Bens digitais, paradoxo do valor, teoria do valor-trabalho, preço de monopólio marxista, economia política marxista

1. Introduction

While modern economic logic predicts that goods with near-zero marginal reproduction costs will tend to be made available for free, the reality of the digital economy reveals a striking paradox: products that can be copied infinitely at virtually zero cost from software, data to platform services not only does not depreciate, but also becomes a source of monopoly profits unprecedented in the history of capitalism (Newman, 2018). This coexistence between technical "absolute surplus" and economic "artificial scarcity" not only challenges the core axioms of neoclassical economics, but also raises fundamental questions for value theory in general: What really determines value and price in the digital economy?

The rise of digital goods in the context of the Fourth Industrial Revolution has profoundly transformed the production and accumulation structure of contemporary capitalism. Digital goods, including software, artificial intelligence algorithms, databases, and digital content, not only have different characteristics than traditional physical goods, but also erode basic assumptions about scarcity, competition, and production costs. In conditions where a unit of product can be reproduced at close to

zero cost, the relationship between use value and exchange value becomes increasingly loose, resulting in forms of pricing that no longer follow the usual logic of competitive markets (Hojnik, 2017).

In recent years, many approaches have been developed to explain the characteristics of the digital economy, especially studies of foundational capitalism and digital labor. These works highlight the role of user data, the network effect, and the expansion of forms of value extraction beyond wage labor. However, existing approaches have significant limitations. *First,* they often do not clearly distinguish between data such as raw materials and digital goods such as finished products, leading to ambiguity in the analysis. *Second,* many studies tend to overextend the concept of labor, considering that every user interaction directly creates value. *Third,* and more importantly, some approaches have invisibly equated value with price, causing the interpretation of economic phenomena to stop at surface manifestations rather than delving into the inner essence.

These limitations show the need to return to the fundamental categories of Marxist political economy, and develop them to suit the conditions of the digital economy. From this perspective, the problem lies not in the denial of labor value theory, but in explaining the transformation in the forms of expression of value under the influence of digital technologies and new monopolistic structures. In particular, it is necessary to clarify the intermediary role of institutions such as intellectual property rights and platform control in maintaining high prices despite low production costs (Wittel, 2016).

Addressing the theoretical gap mentioned above, this article focuses on three main research questions: (i) how the value of digital goods is formed under the condition of marginal reproduction costs approaching zero; (ii) what mechanism leads to the separation between value and price in the digital market; (iii) what is the real role of data and user activity in the value creation process.

On that basis, the study proposes an analytical framework that distinguishes between raw data, digital production materials and complete digital goods.

This paper addresses the theoretical gap by re-establishing the analytical boundaries between data, digital production materials, and complete digital goods, thereby clarifying the mechanism of value formation in the context of marginal reproduction costs approaching zero. Based on a dialectical materialist methodology, the study demonstrates that the value of digital goods remains based on the time of social labor required, while the separation between value and price is mediated by technological monopolistic structures. The central contribution of the article is the development of the concept of "technological monopoly" as a theoretical tool to explain the pricing mechanism in digital capitalism, thereby expanding the applicability of Marxist political economy in the contemporary context.

The article is structured as follows: the next section presents an overview of the theory and analytical framework; the third part describes the research methodology; the fourth part presents the

analysis and results; the fifth section discusses the theoretical implications; and the last part gives the conclusion and direction of further research.

2. Theoretical overview and analytical framework

2.1. Marx's theory of commodities and value: foundational concepts

Marx's analysis of commodities in Capital begins with the remark that the wealth of capitalist societies manifests itself as "a vast collection of goods" (Marx, 1976, p. 125). Commodities are the elemental form of bourgeois wealth, containing in it the fundamental contradictions of the capitalist mode of production. For Marx, the commodity is characterized by duality: it has both use and exchange value. Use value refers to the usefulness of an object, the ability to satisfy human needs or desires. On the other hand, the exchange value manifests as a quantitative relationship in which values using one type are exchanged with values using another.

Marx's basic theoretical breakthrough was to demonstrate that underneath the superficial relativity of exchanged values lies a common entity: labor. "A use-value, or a useful thing, is therefore valuable only because the abstract labor of man is materialized or crystallized in it" (Marx, 1976, p. 129). The magnitude of value is measured by the amount of "social labor time required" to produce a good under normal production conditions and with the same level of proficiency and average labor intensity in society.

Marx further developed this analysis through the theory of commodity fetishism. In capitalist societies, the social nature of labor manifests itself as an objective characteristic of the products themselves. "The mystical nature of the commodity form therefore lies simply in that: it reflects the social characteristics of human labor into the natural characteristics of the products of labor" (Marx, 1976, pp. 164-165). This cult conceals the social relations that underlie the production and exchange of goods, presenting value as a natural attribute of things rather than a social relationship between producers (Gintis and Gintis, 1976).

The distinction between value and price is very important within the framework of Marx's theory. While value is determined by the time of social labor required, price is a monetary expression of value. However, prices can and do frequently detach from value due to a variety of factors, including fluctuations in supply and demand and, more importantly, exclusive conditions. Marx acknowledged that monopolies could allow sellers to overvalue value, appropriating surplus value created elsewhere in the economy.

2.2. Theoretical approaches to digital goods and the digital economy

The development of the digital economy has spurred the formation of diverse streams of research to explain new forms of capital production and accumulation. Three main approaches can be distinguished:

First, the neoclassical approach to economics treats digital goods as an information commodity with the characteristics of marginal reproduction costs of almost zero and non-competitiveness in consumption. According to this logic, the price of digital goods tends to approach zero under conditions of perfect competition. However, this approach struggles to account for the reality of high prices and prolonged monopoly profits in digital markets.

Second, studies of foundational capitalism emphasize the role of network effects, data, and the ability to control digital infrastructure. Srnicek (2017) argues that digital platforms act as intermediaries for data extraction and control, creating new forms of accumulation. According to this view, economic value is not only created during the production process, but also through access control and coordination of interactions. This approach helps explain the concentration of market power but often stops at describing the operating mechanism without clarifying the value base of digital goods. Recent research has expanded this analysis to look at how platform businesses achieve unprecedented levels of mobility and capital concentration through intangible assets.

Third, digital labor theory focuses on the role of users in creating value through the production and provision of data. However, as Wang (2023) critically comments, many studies in this direction tend to overextend the concept of labor, equating all online activities with value-creating labor, thereby blurring the boundaries between production and consumption. This confusion leads to analytical problems, especially the alignment between value creation and value extraction.

2.3. Contemporary debates: from technocracy to feudalism, landlordism, and monopoly

Recent years have seen heated debates about the nature of digital capitalism. The thesis of "techno-feudalism", prominently proposed by Varoufakis (2023) and Durand (2023), argues that digital platforms represent a fundamental break with capitalism, characterized by the dominance of land extraction versus profit generation. In this view, platform monopolies act as feudal lords, extracting "cloud domains" from users and dependent capitalists who have to pay for access to digital domains.

However, this thesis has faced considerable criticism. As Huang (2025) demonstrates, the technocracy-feudal argument makes two fundamental mistakes. *First*, it misreads feudal history: feudalism is characterized by non-economic coercion based on political-legal relations, not merely the extraction of

land land. Land has always existed in capitalism Marx himself devoted an extensive analysis of land land in Capital Volume III. *Second*, it ignores the productive nature of platforms, which are constantly investing in technology and infrastructure, innovating and competing in capitalist dynamics. As Norris and Espinosa (2026) argue, Big Tech's activity remains firmly entrenched in the logic of Marxist value theory, providing the essential means of production for contemporary capitalism.

The question of whether digital monopolies generate profits (from value creation) or land (from value extraction) is therefore central to understanding digital capitalism. Baker (2026) provides empirical evidence of a growing concentration in intangible assets, suggesting that both dynamics are ongoing.

2.4. Marxist political economy and value issues in the digital economy

Researchers of Marxist economic theory have recently sought to apply value theory to digital goods. Ollman (1977) sheds light on Marx's conception of the "transformation of value" in the way that value takes different forms (capital, commodities, profits, incomes, land, wages) throughout the cycle of capital. This perspective is important for understanding digital goods, as value manifests itself differently across stages of production, circulation, and consumption.

A significant contribution comes from the analysis of digital media goods. The study, published in Media, Culture & Society, argues that while the value of reproduced digital media goods tends to go toward zero (according to Marx's definition of value as the time of social labor required), their market prices constitute Marxist monopoly prices. This realization directly resolves the value paradox: worthless copies can still have a positive price due to exclusive conditions.

From the perspective of Marxist political economy, characteristics such as zero marginal reproduction costs and infinite reproduction possibilities do not negate the tenets of labor value theory, but change the form of its expression. The value of digital goods is mainly formed in the initial stage of production (design, programming, development), while the process of remanufacturing does not create new value.

This leads to an important characteristic: the relationship between value and the number of products consumed is weakened. The price of digital goods is therefore no longer a direct reflection of value, but is strongly influenced by factors such as intellectual property rights, platform control, and network effects. Therefore, in order to explain the paradox of value in the digital economy, it is necessary to expand the analysis of Marxist political economy in the direction of considering the role of land forms and monopoly profits in the mechanism of price formation.

2.5. Theoretical gaps and research positioning

From the above overview, three main theoretical gaps can be identified:

(i) Conceptual gap: lack of clear distinction between raw data, digital production materials, and complete digital goods, leading to confusion between products and goods, and between value and price.

(ii) The gap in value theory: the relationship between value and price in the condition of marginal reproduction costs has not been clarified, requiring further development from Marx's perceptions of monopoly prices.

(iii) Gaps in pricing mechanisms: lack of a theoretical tool to explain the role of technological monopolies in maintaining high prices, especially considering the limitations of the technocratic-feudal thesis.

This article aims to fill these gaps through the restructuring of Marxist political economy categories in the context of the digital economy, based on contemporary research while maintaining loyalty to Marxist fundamental perceptions.

2.6. Analytical framework for recommendations

On the basis of the inheritance and development of Marxist theory, this study proposes a three-level analytical framework:

(1) Raw Data: Unprocessed information generated from user activities. Data is not a complete commodity but serves as an input material for the manufacturing process. According to Wang (2023), it is necessary to distinguish between data as a product of activity and data as a commodity.

(2) Digital production materials: Technical infrastructure, algorithms, digital platforms and data processing systems. These factors determine the ability to transform data into valuable products. As Norris and Espinosa (2026) emphasize, these means of production are in themselves products of labor and constitute essential elements of contemporary capitalism.

(3) Complete digital goods: The final product is exchangeable in the market, containing the value created by labor during the production process. These goods can be reproduced at almost zero cost, but their initial production requires the necessary social labor time.

On the basis of this classification, the study establishes two core analytical theses:

In terms of value: the value of digital goods is still determined by the time of social labor required, mainly in the initial stage of production.

In terms of pricing: pricing does not directly reflect value but is determined by technological proprietary structures, including intellectual property, platform control, and network effects.

To explain this mechanism, the article proposes the concept of "technology monopoly land", reflecting the outstanding income that businesses achieve by controlling intellectual property and digital

platforms. This concept builds on Marx's theory of land and land while acknowledging the unique characteristics of digital assets.

The analytical framework of the study can be generalized as follows:

The raw data (input) → processed by the Digital Means of Production → create the Digital Commodity → form value (labor) → express into price (governed by technological monopolies).

3. Research methods

This study uses a qualitative approach based on the Marxist political economy framework to analyze the nature of digital goods and the mechanisms of value formation in the digital economy. Unlike experimental or quantitative studies, the goal of this article is to restructure and develop theoretical categories to explain a phenomenon that paradoxically paradoxes the value of digital goods. The central methodology used is dialectical materialism, which allows the analysis of internal contradictions between use value and exchange value in digital technological conditions. At the same time, the study applies the scientific abstraction method to separate the constituent elements of the production and reproduction of digital goods, thereby building systematic analysis concepts.

The research is designed in the direction of theoretical analysis, which is implemented through three main steps:

Step 1: Develop a conceptual framework

On the basis of an overview of previous studies, the article distinguishes three basic categories: raw data, digital production materials, and complete digital goods. This classification aims to overcome the conceptual confusion that is common in current studies.

Step 2: Analyze the mechanism of value formation

Based on labor value theory, the study examines the role of the social labor time required in the production of digital goods, especially the initial production stage. Focused analysis clarifies the difference between value production and technical reproduction.

Step 3: Analyze the mechanism of price formation

The study further analyzes the decoupling between value and price in the context of technology monopolies through examining the role of intellectual property, platform control, and network effects. On that basis, the concept of "technological monopoly" is proposed as a central theoretical tool.

Due to the theoretical nature of the research, the data used is mainly secondary data, including international academic works related to the digital economy, foundational capitalism, and value theory. In addition, the study uses typical examples from the operation of large digital platforms to illustrate theoretical arguments.

These examples are not intended to test the hypothesis in a quantitative sense, but rather to clarify the mechanism of operation of economic phenomena in a specific context.

In terms of methodology, the research contributes by closely combining dialectical analysis and scientific abstraction to build a theoretical framework capable of explaining new phenomena in the digital economy. This approach allows to overcome the limitations of static analysis models, while maintaining the intrinsic consistency of the theory.

However, the study also has some limitations. Since no quantitative methods or empirical data are used, the conclusions are mostly theoretical and should be further verified through future empirical studies. Moreover, generalizations from typical examples may not fully reflect the diversity of business models in the digital economy.

In summary, the study uses a qualitative approach based on Marxist political economy, combining dialectical materialism and scientific abstraction, to analyze the mechanisms of value and price formation of digital goods in the context of technological monopolies.

4. Analysis and research results

4.1. Value structure of digital goods: differentiating between production and reproduction

Analysis from the perspective of Marx's labor value theory shows that the value of digital goods is formed mainly in the initial stage of production, the stage of creating the first "original" of the digital product. This is a process in which livelihood labor is wasted in specific forms: the labor of software developers, systems engineers, data scientists, user experience designers, quality testing specialists, and project management teams. All of these forms of labor, although differing in their specific nature, attribute abstract labor to the waste of human labor in general and thus the creation of value (Fuchs, 2015).

The value of a digital commodity, in accordance with Marxist principles, is measured by the amount of social labor required to produce it. However, it should be emphasized that the "social labor time required" here is not the average time to create a copy (since that time is close to zero), but rather the time of social labor required to create the product for the first time. This includes the entire process of researching, developing, testing, and perfecting the product until it is ready to go to market (Azhar, 2017).

For example, to create the Windows 10 operating system, Microsoft invested thousands of hours of labor from its team of engineers, programmers, designers, and testing experts over the years. This total amount of social labor time is crystallized in the first "original" of Windows 10, which makes

it worthwhile. When Microsoft sells millions of copies, this value is not added to each copy, but is distributed over the total number of copies sold.

The decisive feature of digital goods is the ability to reproduce at a marginal cost of almost zero. Technically, creating a second, millionth, or billionth copy of a piece of software, a movie, or a database is essentially an automated replication process, requiring negligible amounts of direct labor (mostly server operating energy and system maintenance).

According to labor value theory, this process does not create new value in the true sense. If value is determined by the social labor required, and the process of copying consumes almost zero labour, then the amount of value created in the process of copying also progresses towards zero. This explains why, in terms of pure value, copies of digital goods do not contain new value, they are just "copies" of previously created value.

However, it is important to make a clear distinction: the fact that the copy does not contain a new value does not mean that it is not worth using. Each copy carries the full use value of the original product, it is still a useful tool to meet the needs of consumers. It is this separation between use value (which still exists in full) and value (not created more) that is the core characteristic of digital goods.

From the above two statements, an important consequence can be drawn: the total value of digital goods does not increase along with the number of copies sold. If a software with a value of V is created from the initial labor, and it is sold to n copies, then the average value crystallized in each copy is V/n. As n approaches infinity, the average value in each copy advances to 0.

This leads to a paradox in measurement: how to quantify the value of a particular copy of software when its value is theoretically moving towards zero? The answer lies in the distinction between individual value and market value. While each individual copy has a very small (or even insignificant) amount of value, the total value that the manufacturer derives from the sale is still V which is the value created during the initial production phase. The manufacturer does not "create more value" by selling more copies, but only "recovers" the invested value through the sale of the product on the market.

4.2. The formation of a *technological monopoly*

4.2.1. Theoretical basis: From Marx's land land to technological land

Marx, in Capital Volume III, systematically developed the theory of land land. He distinguishes between differential rent, which arises from differences in the fertility or location of the land, and absolute rent, which arises from land ownership, which allows landowners to collect a sum of money regardless of the quality of the land. Both forms of land represent the transfer of surplus value from industrial capital to landowners, based on exclusive ownership of land.

Applied to the digital context, structural similarities can be seen. Digital assets, especially software, algorithms, databases, and intellectual property rights, also create the ability to collect land based on exclusive control. However, there are important differences that need to be clarified.

Firstly, unlike land, which is a means of production given by nature, not created by labor, digital assets are products of labor. Their value, as analyzed above, is formed from the social labor required. Therefore, the superior income from these assets is not entirely real estate in the classical sense, but rather a combination of profit (from the value created) and real estate (from the monopoly position).

Second, the "immaterial" nature and infinite reproducibility of digital assets create unique characteristics. While land is naturally scarce, the scarcity of digital assets is artificially scarce, created and maintained through legal (copyright, patent) and technical (encryption, access control) mechanisms.

From these analyses, the study proposes the concept of "technology monopoly" to refer to the outstanding income that digital businesses earn based on: (i) Exclusive ownership of intellectual property (ii) Platform control and market access (iii) Advantages from the network effect that create barriers to natural entry.

4.2.2. Origins of technology monopoly land

a. Intellectual property rights as a legal geographical origin

Intellectual property systems, including copyrights, patents, and trademarks, create legal monopolies that allow owners to prevent others from copying or using their digital assets. This is the most direct source of the technology monopoly.

For example, a patent for Google's PageRank algorithm allows the company to exclusively exploit core search technology for years, creating a competitive advantage that cannot be legally copied. Licensing for the Windows operating system allows Microsoft to charge a fee for each copy sold, despite the almost zero cost of reproduction. This outstanding income, the difference between the selling price and the cost of reproduction, is the manifestation of monopoly land.

Theoretically, this land can be analyzed as a form of absolute land in Marxist theory: it arises not from the superior quality of the product, but from exclusive ownership that allows the owner to value it above its real value.

b. Control the foundation as the origin of the structural terrain

Digital platforms such as Apple's App Store, Google Play, Amazon Marketplace, or Facebook are not only places where goods are exchanged, but also "economic spaces" controlled by a single entity. Controlling access to these spaces allows platform owners to collect land from both sides of the market.

Apple's App Store is a good example. Any developer who wants to distribute the app to iPhone users must go through the App Store and accept a fee of 30% on revenue (or 15% for small businesses). This fee is not the price of a particular service that can be quantified by the cost of production, but rather the location of access to the amount of money a developer has to pay to gain access to the user market controlled by Apple.

Similarly, Amazon charges fees from sellers on its platform, and Google and Facebook charge advertisers to reach users. In all of these cases, the superior portion of earnings does not reflect the value created by the platform itself, but rather the transfer of value from the seller/advertiser to the platform owner based on a monopoly position.

Analytically, this is the morphology of the geography difference in digital terms: different platforms have different "positions" in the digital space (user size, engagement, targeting), and this difference creates the ability to collect land to varying degrees.

c. Network effect as natural land origin

Network effects are phenomena in which the value of a product or service increases as the number of people using it increases. This is the core characteristic of many digital platforms: the more users Facebook has, the more attractive it is to new users; The more drivers Uber has, the lower the waiting time and the more attractive it is to passengers.

The network effect creates a natural barrier to entry for potential competitors. A new platform, even with better technology, is also difficult to compete with one that already has a large user network. This allows the dominant platform to maintain its monopoly position and continue to collect land even without special legal protection.

For example, although there are many social networks that compete with Facebook, the advantage of a huge user scale makes it difficult for users to leave the platform. This allows Facebook to maintain a much higher level of ad revenue than smaller competitors.

4.2.3. Operation mechanism of technology monopoly

To understand the operating mechanism of technology monopoly land, it is necessary to analyze the relationship between three factors: value, production price, and market price.

According to Marxist theory, the price of production is formed from the cost of production plus the average profit. Under conditions of perfect competition, market prices tend to revolve around production prices. However, under monopolistic conditions, market prices can far exceed production prices, generating super profits.

For digital goods, due to the marginal cost of reproduction close to zero, the production price of each copy is also close to zero (if only the cost of copying is included). However, the actual market price is positive and often very high. The difference between the market price and the cost of production (almost zero) is the monopoly of technology.

The formula can be represented as follows: $P = c + v + p + r$

In which: P: Market Price, c + v: Cost of production (immutable capital and variable capital), p: Average profit, r: Exclusive Land Technology

For digital goods, c + v for each copy advances towards 0, p also progresses towards 0, so $P \approx r$. In other words, the market price of digital goods is basically constituted of a technological monopoly.

4.3. Experimental evidence through typical cases

Microsoft is one of the classic examples of the ability to collect proprietary technologies. The Windows operating system and the Office suite, after being developed at an initial cost of billions of dollars, can be replicated at almost zero cost. However, Microsoft still sells each copy for hundreds of dollars.

Microsoft's profit margins for decades have remained very high, often above 30-40% of revenue, far exceeding the average profit margin of the economy. This part of the superior profit cannot be explained by higher labor productivity or superior technology (since competitors such as Linux are of comparable quality), but must be explained by a proprietary geography based on:

(i) Intellectual property rights to source code

(ii) Network effects (application ecosystem and user skills)

(iii) Market dominance has been maintained over the years

Apple provides a more complex example of a technology monopoly, combining all three of the sources analyzed.

First, Apple collects land from intellectual property through the sale of hardware at a price much higher than the cost of production. The iPhone costs about $400-500 in components and assembly but

sells for $1000 or more. This difference is not only the usual profit but also includes the land from the brand and the ecosystem.

Second, Apple collects land from platform control through the App Store. The 30% fee from app revenue and in-app purchases is a clear access location. Developers must pay this fee to reach the iPhone user market, regardless of the cost of operating Apple's App Store.

Third, Apple benefits from the network effect in its ecosystem. iPhone users stay with the Apple ecosystem in part because they have invested in apps, data, and usage habits, creating high conversion costs. This allows Apple to maintain high valuation.

Google and Facebook represent another form of technology monopoly: the geography of user data and ad targeting.

Technically, Google offers free search services to users, but charges advertisers a fee to show ads to users. The same pattern applies to Facebook. The advertising revenue of these two companies amounts to hundreds of billions of dollars per year, with very high profit margins.

This revenue cannot be fully explained by the cost of operating the advertising system or the labor value of the sales team. It's mostly data-driven—the money advertisers pay to reach users that Google and Facebook control exclusively.

The mechanism of formation of this land is as follows:

(i) Users generate data through online activity (search, social interaction)

(ii) Platforms that collect, process, and analyze this data

(iii) Data transformed into accurate ad targeting

(iv) Advertisers pay to use this capability

(v) The amount paid in excess of the cost of data collection and processing is the land.

4.4. The difference between technology monopoly land and traditional forms of land

In order to complete the analytical framework, it is necessary to clarify the differences between the technological monopoly land and the traditional forms of land that Marx analyzed.

Table 1: Comparison of land and technology proprietary land

Criteria	Land Plot	Exclusive technology
Origin of Assets	Natural, not labor-generated	Created by labor, crystallized value
Scarcity	Natural scarcity	Artificial scarcity (created by legal/technical)

Reproducibility	Non-reproducible	Infinitely reproducible at zero cost
Exclusive Base	Land Ownership	Intellectual property, platform control, network effects
Forms of land collection	Land lease, harvest	Royalties, platform fees, advertising fees
Relationship with Values	Transfer of surplus value	A combination of value recovery and transfer

Source: Compiled by the author (2025)

The most important difference is this: land is a pure transfer of surplus value from industrial capital to landowners, based on ownership of a property not created by labor. Meanwhile, the technological monopoly is of a dual nature: partly the recovery of value that has been created from labor in the initial production process, and partly the transfer of surplus value from other sectors based on monopoly status.

4.5. Synthesis: Land model with exclusive technology

From the above analysis, it can be summarized into a theoretical model of technology monopoly land as follows: Exclusive Land Technology = f (IP, KSNN, HUMN) + α

In which: IP: Level of intellectual property protection

State Audit: Level of control over the platform and the ability to impose access fees

HUMN: The Power of Network Effects and Conversion Costs

α: Other factors (brand, trade secrets, foregoing advantage)

This model explains why digital businesses can maintain high profit margins despite zero reproduction costs. At the same time, it also explains the difference in profitability between digital businesses: businesses that control all three factors (strong intellectual property, proprietary platforms, large network effects) will have the highest ability to collect real estate.

5. Discussion

5.1. Theoretical implications

The findings have important implications for Marxist value theory. They demonstrate that labor value theory remains solid in explaining the digital economy, provided that the analysis distinguishes between different stages of production and recognizes the role of monopoly in price shaping. The concept of monopoly geospatial technology extends Marx's analysis of monopoly geospatial and price to the digital context. It shows that, although the form of expression has changed, the nature of the relationship of exploitation and the transfer of surplus value still exists in new forms.

In particular, this analysis contributes to resolving the debate about "technocracy-feudalism". If the technocratic-feudal thesis suggests that capitalism has been replaced by a new system based on land, the above analysis shows that: (1) land has always existed in capitalism, not a new phenomenon; (2) the technological monopoly still operates in the logic of capital accumulation, not breaking it; (3) Digital businesses both create value (through labor in initial production) and extract land (through monopoly status). Thus, there was no "rupture" or transition to the new feudal system, but only the development of monopoly capitalism in the form of technology.

5.2. Comparison with other approaches

The Recommendation Analysis Framework has advantages over existing approaches.

Compared to neoclassical economics, this analytical framework explains why prices do not converge to zero in the long term, and why digital businesses can maintain monopoly profits. It provides the theoretical basis for the phenomenon of "monopoly pricing", which neoclassical economics can only explain by exogenous factors such as "product differentiation" or "asymmetrical information".

Compared to extended digital labor theories, this analytical framework avoids confusion between data creation and value creation. It asserts that users are not "digital workers" in the sense of creating value, even though their data is the critical material. This is consistent with Marx's analysis of the role of raw materials in capitalist production. Compared to studies of foundational capitalism, this analytical framework adds a value-theoretical basis to descriptions of the mechanisms of foundation operation. It explains why platforms can charge high fees, not just describe how they charge fees.

The analysis of the technology monopoly has important policy implications. *First,* if the majority of digital commodity prices are monopolies, then antitrust policies need to be strengthened to protect consumers and promote competition. The fact that big platforms charge a 30% fee from the developer is not a "market price" in competitive conditions, but a land based on a monopoly position. *Second, the* intellectual property system needs to be revisited to strike a balance between encouraging innovation and preventing monopoly abuse. Too long a term of protection can create a prolonged monopoly that is not

commensurate with the creative contribution. *Third,* it is necessary to have a mechanism to redistribute value from technology monopoly land. If a large part of social value is converted into land for some technology corporations, it is necessary to have tax and welfare policies to redistribute and ensure the interests of the whole society.

6. Conclusion

This paper solves the paradox of the value of digital goods by developing a Marxist framework of political economy analysis that distinguishes between raw data, digital means of production, and complete digital goods. The analysis proves that: The value of digital goods is still derived from the time required for social labor, which is mainly wasted in the initial production stage. The process of technical reproduction does not create new value, but only allocates the already existing value to the number of copies. Near-zero marginal cost of reproduction does not negate labor value theory but changes the way value is expressed. The value of each individual copy gradually goes to zero, but the total recovered value remains the same as the original value.

Price is detached from value due to technological proprietary structures, including intellectual property, platform control, and network effects. The difference between the market price and the cost of production (almost zero) is the monopoly of technology. The concept of proprietary real estate technology provides a reasoning tool to explain persistently high prices and outstanding profits in the digital market. It combines Marx's analysis of land with the unique characteristics of digital assets, while avoiding the theoretical mistakes of the technocratic-feudal thesis. Data must be understood as raw materials rather than as a commodity or a direct source of value. The role of the user is to create the material, but value is only created when the material is processed by labor (of engineers, data scientists, programmers) through digital production materials.

The paper contributes to a critical understanding of digital capitalism by expanding Marxist categories to new phenomena while maintaining theoretical consistency. It challenges both neoclassical economics' predictions of zero price convergence and overextended notions of digital labor, providing a more accurate analytical framework for understanding value and price in the digital economy. Future research needs to empirically validate the geologic model of technology monopoly on specific digital industries, and consider the policy implications of antitrust, intellectual property reform, and value redistribution in the digital economy.

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