

# UNRAVELING THE DYNAMICS OF INTELLECTUAL LABOUR AND TECHNOLOGICAL PROGRESS UNDER CAPITALISM

**Marcela Emediato**

(UFRJ)

**Leonardo Gomes de Deus**

(Cedeplar-UFMG)

## ABSTRACT

Since the 1970s, the Fordist production model has faced challenges in maintaining productivity levels. This has led to a reorganization of production into more flexible models, incorporating smaller companies and increasing the use of information and communication technologies (ICTs). These changes have had a profound impact on labour organization, qualifications, and modes of existence. This article aims to examine whether these changes have preserved the capital's ability to control the labour process in unity with the process of valorisation. It analyses how technological evolution has posed a problem of inadequacy in the technical form of capital, affecting its ability to sustain and reproduce itself. To achieve this objective, we discuss how historically the process of valorisation has shaped the labour process, especially intellectual labour and so-called "immaterial" labour, which has gained prominence in recent decades. Therefore, we debate how the labour process and technological progress are conditioned by the accumulation process.

**Keywords:** Intellectual Labour. Labour theory of value. Post-Fordism.

## RESUMO

Desde a década de 1970, o modelo de produção fordista tem enfrentado desafios para manter os níveis de produtividade. Isso levou a uma reorganização da produção em modelos mais flexíveis, incorporando empresas menores e aumentando o uso de tecnologias de informação e comunicação (TICs). Essas mudanças tiveram um impacto profundo na organização do trabalho, nas qualificações e nos modos de existência. Este artigo tem como objetivo examinar se essas mudanças preservaram a capacidade do capital de controlar o processo de trabalho em conjunto com o processo de valorização. Ele analisa como a evolução tecnológica colocou um problema de inadequação na forma técnica do capital, afetando sua capacidade de se sustentar e reproduzir. Para tanto, foi discutido como historicamente o processo de valorização conformou o processo de trabalho, especialmente o trabalho intelectual e os trabalhos ditos "imateriais", que ganharam destaque nas análises das últimas décadas. Com isso, foi possível debater como processo de trabalho e progresso tecnológico são condicionados ao processo de acumulação.

**Palavras-chave:** Trabalho Intelectual. Teoria do valor. Pós-Fordismo.

**Área 3 - História Econômica, do Pensamento Econômico e Demografia Histórica**

## INTRODUCTION

The idea of an emerging post-industrial economy since the 1970s is advocated in the realm of value theory by authors such as André Gorz, Antonio Negri, Michael Hardt - among others - who raise questions about the capital's ability to command the labour process while maintaining its unity with the process of valorization after the decline of the Fordist model of production. On one hand, André Gorz (2005) assimilates the changes in the economy as indicative of the emergence of a "knowledge economy

The author suggests that there is difficulty in reducing cognitive immaterial work to abstract labour due to the inherent difficulty in measuring knowledge. Therefore, there is a crisis in the substance of value which, however, does not cause the dissolution of capitalist social relations. Instead, it imposes a challenge on capital to fulfill its objective of self-valorization when immaterial labour becomes predominant.

On the other hand, Michael Hardt e Antonio Negri (2000) approach the issue differently, arguing that the decline of the Fordist model has led to the emergence of an informational economy, in which the division between services and manufacturing goods has become "blurred," resulting in shifts in both quality and nature of labour (HARDT; NEGRI, 2000, p. 289). For them, the computerization of the production process has been essential in this transformation, further reducing the heterogeneity of concrete labour and distancing labour process even more from its object:

The labor of computerized tailoring and the labor of computerized weaving may involve exactly the same concrete practices [...]. Tools, of course, have always abstracted labor power from the object of labor to a certain degree. In previous periods, however, the tools generally were related in a relatively inflexible way to certain tasks or certain groups of tasks; different tools corresponded to different activities [...]. The computer proposes itself, in contrast, as the universal tool [...]. Through the computerization of production, then, labor tends toward the position of abstract labor (HARDT; NEGRI, 2000, p. 292).

Without getting into how the concept of abstract labour is comprehended by them, it is noted that, for the authors, the informational economy, facilitated by computers, further fragments, standardizes, and distances labour from its final objective compared to its organization under a Fordist model. Additionally, it is essential to consider the characteristic that different types of immaterial labour possess, described by them as *inherently cooperative* due to its inability to be organized 'from the outside'.

In this sense, Hardt and Negri (2000) question the ability of real subsumption of new types of labour under capital, as capital no longer organizes itself highly hierarchical structures, nor does the control process take place in the same way Marx was able to observe in his elaborations on large-scale Industry. Their inquiry extends beyond the

concrete aspect of "immaterial" labour to be organized within a capitalist framework, as suggested by Gorz. Instead, they cast doubt on the very concept of what it means for labour to be organized within a capitalist context.

From this contextualization, the objective of this article is built upon analysing the ability of capital to command the labour process while maintaining its unity with the valorization process in the face of increasing technological and informational changes since the 1970s, in order to observe if there is a problem of inadequacy of the technical form of capital as suggested by the aforementioned authors.

## **THE LABOUR PROCESS OF INTELLECTUAL LABOUR**

The process of valorization, given its importance and particularity, has been elaborated upon from the *Grundrisse* to *Capital*. Generally, it can be understood by examining the moment when capital acts as productive capital, as it is during the production process (P) that the valorization process, the creation of value, occurs. When the capitalist sets labour-power in contact with the means of production, he is "lucky enough" to find within it the capacity to preserve the value already embodied in the means of production, while simultaneously creating new value. Labour, as the use-value of the workforce, thus, through its concrete and useful nature, transfers the value of the means of production used to the product; through its abstract nature, it is the source of new value. Dead labour is replaced by living labour

In Book I of *Capital*, when writing about the "*The Labour Process and the Valorization Process*", Marx discusses how the extension of the working day beyond the necessary time during production is what enables the productive process to be more than a mere value-forming process and becomes a valorization process — transforming commodity production into specifically capitalist commodity production —, as “[...] the surplus-value results only from a quantitative excess of labour, from a lengthening of one and the same labour-process [...]” (MARX, 1976, p. 305). The result of this process is a commodity augmented with surplus-value, C', which belongs to the capitalist rather than the direct producer, the worker. This appropriation of surplus-value by the capitalist occurs due to the extension of the working day beyond what is necessary. Hence, it is understood that what characterizes the capitalist form of commodity production is “[...] is the process of production of commodities; considered as the unity of the labour process and the process of valorization, it is the capitalist process of production, or the capitalist form of the production of commodities [...]” (MARX, 1976, p. 304).

In the Manuscript of 1861-1863, Marx elaborates more than in *Capital* on the process of capital production, aiming to explain how the synthesis of the labour process

and the valorization process, both components of capital production, results in money becoming capital and multiplying itself (DE DEUS, 2010, p. 14–15).

As a result, the labour process also gains specific outlines. Since the sole objective of production is the generation of surplus-value, the valorization process becomes the true purpose of the labour process. The exchange of money for labour power does not aim at the use-value of what will be produced, but merely at transforming money into capital, in other words, it aims at the production of exchange value (MARX, 2010, p. 81). In this mode of production, capital not only takes control of the labour process but also ensures that it "is only possible where the valorization process is possible" (DE DEUS, 2010, p. 14). Just as the production of use-values is viewed as a means, the labour process is also relegated to this position of "uncomfortable condition" (MARX, 2010, p. 110–111).

Therefore, the capital's ability to valorize and create surplus-value arises from the consumption of labour power, the inherent characteristics of labour, and the production relations established among individuals. Thus, it is not necessary to sell a specific product for valorization to occur, as valorization itself determines whether there will be production.

In another part of the *Manuscript of 1861-1863*<sup>1</sup>, known for its edition by Kautsky, *Theories of Surplus-Value*, Marx reiterates how the outcome of the capitalist production process - the creation of surplus-value - is only achieved through the exchange for labour, denoted as *productive labour*. As can be seen in the Addenda to Part 1 of the *Theories...* in the section titled *Productivity of Capital. Productive and Unproductive Labour* where the specific use-value of productive labour for capital is discussed, Marx asserts about capital itself:

Its aim is the *accumulation of wealth*, the *self-expansion of value*, its *increase*; that is to say, the maintenance of the old value and the creation of surplus-value. And it achieves this *specific product* of the capitalist production process only in exchange with labour, which for that reason is called *productive labour* (MARX, 1968, p. 400).

To characterise labour as productive, the specific use-values being produced are of no concern to capital, nor are the particular concrete attributes of the labour itself; even less so are the characteristics of the product in which the labour manifests (MARX, 1968).

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<sup>1</sup> It should be emphasized that, both in the Grundrisse and in the Manuscript of 1861-1863, the distinction between value and exchange value had not been fully consolidated. Therefore, the use of the term "value" in the context of the analysis of these specific works in the present study encompasses this differentiation and chooses to use the term "value" with the perspective of the later revealed category of exchange value in mind.

What truly matters is the labour's capacity to be equated, reduced to abstract labour, and create value<sup>2</sup>:

What forms its specific use value for capital is not its *specific useful character*, any more than it is the particular useful properties of the product in which it is materialised. But what forms its specific use-value for capital is its character as the element which creates exchange-value, abstract labour; [...] (MARX, 1968, p. 400).

It is crucial to emphasize that the ability to generate value relies on the utilization of a specific use-value. This implies that, despite the capitalist's attempts to suppress it, there is a constant need to seek new use-values and diverse forms of concrete labour.

Consequently, the established social relations of production play a decisive role in determining whether labour is considered productive. This aspect is also discussed in a previous passage from the *Manuscript of 1861-1863*, found in Chapter IV of the first volume of *Theories...*, titled *Theories of Productive and Unproductive Labor*, which examines the elements defining productive labour within the context of capital:

Productive labour, in its meaning for capitalist production, is wage-labour which, exchanged against the variable part of capital (the part of the capital that is spent on wages), reproduces not only this part of the capital (or the value of its own labour-power), but in addition produces surplus-value for the capitalist. It is only thereby that commodity or money is transformed into capital, is produced as capital. Only that wage-labour is productive which produces capital. (This is the same as saying that it reproduces on an enlarged scale the sum of value expended on it, or that it gives in return more labour than it receives in the form of wages. Consequently, only that labour-power is productive which produces a value greater than its own.) [...] Productivity in the capitalist sense is based on relative productivity—that the worker not only replaces an old value, but creates a new one; that he materialises more labour-time in his product than is materialised in the product that keeps him in existence as a worker (MARX, 1968, p. 152-153).

The extension of the working day beyond what is necessary as a means to obtain surplus value and thus transform money into capital - the multiplication of money - is clearly regarded as part of what is considered productive labour. Subsequently, the chapter introduces physiocratic and mercantilist conceptions of productive labour, which initiate the debate regarding the Smithian conception of this category and its relationship with subsequent ideas in economic thought that permeate the discussion on the subject. It is observed that, for Marx, the concept of productive labour is important because it allows for an understanding of how the origin and form of surplus value production are interpreted by different thinkers in different contexts. The Smithian conception, for example, diverges from that of the physiocrats and mercantilists precisely due to its ability to see beyond agricultural labour and labour employed in branches whose products, when

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<sup>2</sup> The point made in the previous note is reiterated.

exported, favoured participation in the gold and silver mines of the time. Smith was able to perceive that productive labour in capitalist production is "*labour which is directly exchanged with capital*" (MARX, 1968, p. 157). Additionally, unproductive labour was identified by Smith as that which is exchanged for revenue, whether it be wages or profit. In Smith's view, therefore, initially, what matters is "the standpoint of the possessor of money, from the standpoint of the capitalist, not from that of the workman" (MARX, 1968, p. 158)". Up to this point, Smith is correct in observing the specific social form that labour takes under determined capitalist social relations. For Marx, when it comes to productive labour the use-value of the commodity is irrelevant to qualifying labour as productive or unproductive because it can be "of the most futile kind" (MARX, 1968, p. 158) and still create surplus value. Similarly, the way the labour is embodied, whether it is in a "material" or "immaterial" commodity, does not alter the differentiation between productive and unproductive labour:

For example, the cooks and waiters in a public hotel are productive labourers, in so far as their labour is transformed into capital for the proprietor of the hotel. These same persons are unproductive labourers as menial servants, inasmuch as I do not make capital out of their services, but spend revenue on them. In fact, however, these same persons are also for me, the consumer, unproductive labourers in the hotel. [...] In the one case the labour is exchanged with capital, in the other with revenue. In the one case the labour is transformed into capital, and creates a profit for the capitalist; in the other case it is an expenditure, one of the articles in which revenue is consumed. For example, the workman employed by a piano maker is a productive labourer. His labour not only replaces the wages that he consumes, but in the product, the piano, the commodity which the piano maker sells, there is a surplus-value over and above the value of the wages. But assume on the contrary that I buy all the materials required for a piano (or for all it matters the labourer himself may possess them), and that instead of buying the piano in a shop I have it made for me in my house. The workman who makes the piano is now an unproductive labourer, because his labour is exchanged directly against my revenue (MARX, 1968, p. 159-160).

Therefore, the characteristic of labour being productive is related to it being organized under capitalist forms, serving as means for the creation and appropriation of surplus value. The waiters become capital for the hotel owner even if their labour is not "embodied" in a specific commodity, just like the actor or the clown.

However, the Smithian conception of productive labour has a second aspect, focused on asserting that labour needs to be realised in tangible commodities. This leads Marx's subsequent argument to remain concerned with demonstrating the contradiction contained in the insertion of this qualification, as well as the relevance of understanding the specific social form of capitalist relations of production and pointing out the problems that the incorrect understanding of this causes. Marx points out how the focus on materiality, the need to fix value in "sellable" objects, gives the term "productive" a

different connotation for Smith, which moves away from the connection with the production of surplus value and approaches the notion that labour is productive when it adds a quantity of value equal to that contained in the wage.

Thus, Marx points out a regression of Smith to the physiocratic conception, which is evident when he considers agricultural labour "more productive" than manufacturing labour (MARX, 1968, p. 168). Moreover, Smith contradicts himself by considering that intellectual labour necessary for the production of a "tangible" commodity, such as that of a supervisor, engineer, or manager, is productive simply because it is necessary in the manufacturing process. On the other hand, he always classifies the labour of those who provide personal services as unproductive regardless of whether the labour could become productive if the buyer varies. It suffices to see that workers who repair furniture in the domestic sphere can have productive labour if the furniture they repaired is sold to obtain surplus value, turning labour that would be unproductive into productive. Therefore, Marx criticizes Smith for his limited understanding of how certain services can contribute to profit generation, including those that vanish after they are produced:

Given that, one must consider that there was a difficulty for capital to establish itself where there was no material production of material commodities, while there was a strong presence of people employed in the provision of personal services. Adam Smith had a great concern in differentiating these services from manufacturing labour, which is argued to be one of the reasons that led him to include the adjective "vendible" in his definition of productive labour. However, such concern led to an exaggerated focus on the technical-physical characteristics of labour and its products, and as a result, a view on services was consolidated that disregarded any capacity for these activities to be subordinated to capital forms of production. Marx acknowledges that there are particularities of services that make it difficult for them to follow a logic of production similar to that of other commodities. However, this difficulty can also be found in other branches of "material production". It is necessary to have clarity in understanding what defines the specific character of capitalist production, and certainly this should not be done based on the analysis of use-values, which as discussed before, is not a characteristic restricted to capitalism.

As several economists who succeeded Smith chose to focus on the aspect centered on the materiality of the commodity rather than its relationship with capital, criticisms about the ability of the labour theory of value to understand reality accumulated, leading it to lose much ground. More specifically, as there was growth in "immaterial" labour and

commodities production, new attempts to understand them continued to emerge, with doubts about the capacity of Marx's theory of value to reflect the current stage of the capitalist mode of production, as presented in the introduction of this article.

Understanding the social relations of production allows us to see how services fit within the realm of consumable items. Attempts to comprehend them as something apart from commodity production create difficulties and encounter limitations. In general, Adam Smith ties the concept of productivity to the production of vendible commodities, disregarding labour power itself as a commodity "of which labour itself is the temporary manifestation" (MARX, 1968, p. 171). Because of this, he fails to comprehend how "immaterial" labour can repeatedly be subjected to the capitalist logic, serving as productive labour.

Criticisms regarding the labour theory of value's ability to comprehend reality accumulated alongside the growth of "immaterial" labour and commodities, as discussed in the introduction of this article. It is argued that the definition of productive labour plays a pivotal role in fuelling this controversy, particularly the excerpt from the "Addenda" of *Theories...* regarding the "Supplementary Definition of Productive Labour as Labour Which Is Realised in Material Wealth", transcribed below:

In considering the essential relations of capitalist production it can therefore be assumed that the entire world of commodities, all spheres of material production—the production of material wealth—are (formally or really) subordinated to the capitalist mode of production [...]. On this premise—which expresses the limit [of the process] and which is therefore constantly coming closer to an exact presentation of reality—all labourers engaged in the production of commodities are wage-labourers, and the means of production in all these spheres confront them as capital. It can then be said to be a characteristic of productive labourers, that is, labourers producing capital, that their labour realises itself in commodities, in material wealth. And so productive labour, along with its determining characteristic—which takes no account whatever of the content of labour and is entirely independent of that content—would be given a second, different and subsidiary definition (MARX, 1968, p. 409-410).

The way productive labour is defined above seems to resemble the harshly criticized second aspect of Adam Smith's productive labour, as if Marx had contradicted himself. However, it is possible to argue that what the passage above analyses is the capital's ability to establish itself in certain sectors. As previously mentioned, Marx, in *Theories...*, observed the capital's difficulty in establishing itself in personal services sectors, while noting a rapid expansion in various branches of material production. With this in mind, he assumed that all branches of material production would be subsumed to the capitalist mode of production as capital tended to increasingly dominate production sectors and workers, in a way that all workers in the production sphere would become productive employees.



One of the reasons that justify this interpretation is that, just above this passage, the discussion revolves around how the labour of handicraftsmen and peasants existed without being subsumed into the capitalist mode of production, managing to reproduce their own labour power and, at times, even produce a surplus from which they appropriated themselves, without being considered productive workers. Marx states about them:

In this capacity they confront me as sellers of commodities, not as sellers of labour, and this relation therefore has nothing to do with the exchange of capital for labour; therefore also it has nothing to do with the distinction between productive and unproductive labour, which depends entirely on whether the labour is exchanged for money or for money as money as capital. They therefore belong neither to the category of *productive* nor of *unproductive* labourers, although they are producers of commodities. But their production does not fall under the capitalist mode of production (MARX, 1968, p. 407).

This is possible because “we come up against a peculiarity that is characteristic of a society in which one definite mode of production predominates, even though not all productive relations have been subordinated to it” (MARX, 1968, p. 407). However, it is often portrayed as if these activities follow the same logic, with the farmer acting as a capitalist who employs himself as a wage labourer to profit from the means of production he owns. Thus, it is disregarded that “the means of production become capital only in so far as they have become separated from labourer and confront labour as an independent power” (MARX, 1968, p. 408) and that it is only possible for the producer to appropriate the surplus he produces, not through his labour “which does not distinguish him from other labourers” (MARX, 1968, p. 408), but rather because he is the owner of the means of production. As capitalism develops, this becomes less common, with fewer and fewer workers having this possibility:

Here emerges in a very striking way the fact that the capitalist as such is only a function of capital, the labourer a function of labour-power. For it is also a law that economic development distributes functions among different persons; and the handicraftsman or peasant who produces with his own means of production will either gradually be transformed into a small capitalist who also exploits the labour of others, or he will suffer the loss of his means of production [...] and be transformed into a wage-labourer. This is the tendency in the form of society in which the capitalist mode of production predominates (MARX, 1968, p. 408).

Therefore, the excerpt reinforces that an essential aspect for the production of capitalist commodities is the subordination to the specific social relations of this typical mode of production, which aims at the production of surplus value, even though other forms of commodity production with distinct logics may coexist within it, which has nothing to do with the concrete characteristic of labour or the outcome of the production process. What is actually observed is a constant endeavour of capital to expand into all

branches of material production, which is not achieved with the same ease in services, or in "immaterial production" as a whole.

Another argument is found in the passage following the section on the "Supplementary Definition" of productive labour in which Marx discusses the "Manifestations of Capitalism in the Sphere of Immaterial Production." Immaterial production is understood through the production of commodities of two main categories. Firstly, there are those that can be separated from their producers, such as a painter who can sell a painting. Secondly, there are those in which "the production cannot be separated from the act of producing" (MARX, 1968, p. 410). In the former, the application is described as possible, but "very restricted," as in the case of a writer who, to produce an encyclopedia, exploits the work of various other writers. As a rule, there is no subsumption, not even formal, into the capitalist mode of production, only a kind of *transitional* form towards capitalist production (which does not exclude the possibility of labour *exploitation*). In the latter, situations are described in which the "immaterial" worker assumes the position of a productive worker in relation to the entrepreneur who hires them, as is the case with teachers and some artists (MARX, 1968, p. 410-411).

There is thus a distinction between labour that, even if intellectual, manages to produce a commodity, and that whose end is itself "immaterial." And the way they will be subordinated to capital also happens differently. In the latter case, the possibilities of these activities being truly subsumed under capital are "are so insignificant compared with the totality of production that they can be left entirely out of account" (MARX, 1968, p. 411). In this sense, it is argued, in agreement with Rubin (1973), that the "supplementary definition of productive labour" does not contradict the main definition of productive labour based on the social form of production, as it needs to be understood based on two main assumptions "1) that material production as a whole is organized on capitalist principles, and 2) that non-material production is excluded from our analysis, production labour can be defined as labour which produces material wealth" (RUBIN, 1973, p. 266).

In this sense, the focus of this definition lays on the fact that production organized under capitalist principles rapidly expands in the realm of material commodities, while, with the technology of the time, this was much more difficult in the realm of non-material production, making it impossible to even consider the possibility of exporting services that are already exportable today. Due to this scenario, capitalist non-material production was seen as very small and difficult to be expanded, so it could be disregarded, thereby

allowing for the restriction of productive labour to the sphere of material commodity production.

Then, despite this supplementary definition, which focuses on analysing production trends, there doesn't seem to be a renunciation by Marx regarding the aspect of the way labour is organized to be the main condition for defining the ability of labour to become a producer of surplus value.

In agreement, Cotrim (2012) argues that in the passage with the supplementary definition, there is no juxtaposition of material production against immaterial production, only an observation on how the productive labour of value has permeated all spheres of production due to the constant need of capital to expand, creating a tendency to subordinate all social production to itself (COTRIM, 2012, p. 187). Marx places material production in a "preponderant place" in relation to the immaterial, but does not characterize immaterial labour as unproductive, as can be seen in the passages cited above where various "immaterial labours" are mentioned as examples of productive labour (COTRIM, 2012).

Furthermore, excerpts from Book I of *Capital* are added to the argument support the view that, for the production of surplus value, it matters little whether sausages or education are being produced.

Capitalist production is not merely the production of commodities, it is, by its very essence, the production of surplus-value. The worker produces not for himself, but for capital. It is no longer sufficient, therefore, for him simply to produce. He must produce surplus-value. The only worker who is productive is one who produces surplus-value for the capitalist, or in other words contributes towards the self-valorization of capital. If we may take an example from outside the sphere of material production, a schoolmaster is a productive worker when, in addition to belabouring the heads of his pupils, he works himself into the ground to enrich the owner of the school. That the latter has laid out his capital in a teaching factory, instead of a sausage factory, makes no difference to the relation. The concept of a productive worker therefore implies not merely a relation between the activity of work and its useful effect, between the worker and the product of his work, but also a specifically social relation of production, a relation with a historical origin which stamps the worker as capital's direct means of valorization. To be a productive worker is therefore not a piece of luck, but a misfortune (MARX, 1976, p. 644).

It is not belonging to the material sphere that determines whether a commodity serves the process of capital self-valorization or not. Thus, despite a commodity not necessarily being produced in a capitalist manner, even though the dominant mode of production is such, the choice of a schoolmaster as an example of a productive worker reaffirms a broad conception of commodity and production, in which the material aspect of what is produced is not taken into account.

It is reiterated that the irrelevance of the concrete nature of labour for its definition as productive extends to whether it is "physical" or intellectual labour. If intellectual labour is organised and necessary for the capitalist production process, it is also productive labour capable of producing surplus value. This is understood primarily because in the process of subsuming labour to capital, when different types of labour are equated into an average, initially through cooperation, which forms the basis for manufacturing, and subsequently for the machinery system, products are not produced from start to finish by the workers. An increase in production is required, demanding that workers perform partial labour processes. Thus, an apparent antagonism between intellectual and manual labour is constructed, when in fact, they are often connected because they are part of the same production chain of a social product.

Therefore, if integrated into the production of a final material product, it is not possible to classify intellectual labour as "non-material," as it is collective labour necessary for the production of a particular commodity, regardless of the distance at which it is located from what is produced. As Rubin states:

Intellectual labor necessary for the process of material production in no way differs from physical labor. It is "productive" if it is organized on capitalist principles. In this case it is completely the same thing whether the intellectual labor is organized together with the physical labor in one enterprise (engineering bureau, chemical laboratory or an accounting bureau in a factory), or separated into an independent enterprise (an independent experimental chemical laboratory which has the task of improving production, and so on) (RUBIN, 1973, p. 265).

Therefore, it is important to emphasize that when analysing the process of surplus value production, especially the product of P, the stage at which capital stands as productive capital, in Volume II of Capital, Marx observes the possibility that a product may have (i) "an existence of its own, apart from the production process, possessing a useful form different from that of the elements of production" (MARX, 1978, p. 134); (ii) or, furthermore, that the product is not a new object, as is the case with the sale of information transfer, letters, telegrams, etc. In this case, the formula of this process would be:

$$M - C\{Mp L \dots P - M'$$

The result is the altered spatial existence, as occurs with the transport industry:

But what the transport industry sells is the actual change of place itself. The useful effect produced is inseparably connected with the transport process, i.e. the production process specific to the transport industry. People and commodities travel together with the means of transport, and this journeying, the spatial movement of the means of transport, is precisely the production process accomplished by the transport industry. The useful effect can only be consumed during the production process; it does not exist

as a thing of use distinct from this process, a thing which functions as an article of commerce and circulates as a commodity only after its production. However the exchange value of this useful effect is still determined, like that of any other commodity, by the value of the elements of production used up in it (labour power and means of production), plus the surplus-value created by the surplus labour of the workers occupied in the transport industry. In respect of its consumption, too, this useful effect behaves just like other commodities. If it is consumed individually, then its value vanishes with its consumption; if it is consumed productively, so that it is itself a stage of production of the commodity that finds itself transported, then its value is carried over to the commodity as an addition to it (MARX, 1978, p. 135).

The use value of what is sold disappears at the moment of consumption. There is no factor in the capital valorization process that requires materiality of its result, and as the productive forces develop, creating autonomous industrial branches such as transport, this becomes clearer. In *Theories...* it is read:

When we speak of the commodity as a materialisation of labour—in the sense of its exchange-value—this itself is only an imaginary, that is to say, a purely social mode of existence of the commodity which has nothing to do with its corporeal reality; it is conceived as a definite quantity of social labour or of money. It may be that the concrete labour whose result it is leaves no trace in it. In manufactured commodities this trace remains in the outward form given to the raw material. In agriculture, etc., although the form given to the commodity, for example wheat or oxen and so on, is also the product of human labour, and indeed of labour transmitted and added to from generation to generation, yet this is not evident in the product. In other forms of industrial labour the purpose of the labour is not at all to alter the form of the thing, but only its position. For example, when a commodity is brought from China to England, etc., no trace of the labour involved can be seen in the thing [...]. Therefore the materialisation of labour in the commodity must not be understood in that way. (The mystification here arises from the fact that a social relation appears in the form of a thing) (MARX, 1968, p. 171).

## **REAL SUBSUMPTION OF LABOUR UNDER CAPITAL**

As stated in the previous section, the process of labour being subsumed to capital is fundamental for understanding the role of intellectual labour in the valorization process. It is noticeable already in the *Grundrisse* the investigative effort to find the transformative stages of the labour process until the arrival at the social form of relative surplus value, in which it is completely revolutionised and manages to surpass the barrier of absolute surplus value, which already exists in other modes of production. In the excerpt of these manuscripts where forms that preceded capitalist production are discussed it is described a process in which a merchant begins by purchasing the product of labour from weavers and spinners. Gradually, this merchant starts to buy the product of more and more weavers and spinners, until, to reduce production costs, he starts to gather them together, and thus stops buying the products and starts buying the labour of these people. Then occurs the

subordination to capital of existing labour processes through the separation of the objectified conditions of labour.

For the merchant's money to be able to act as capital presupposes the historical process in which the objective conditions of labour are separated from the workers, in this case, the weavers and spinners. These still produced based on their subsistence and production associated with the use value, and then they start to face the divorce between labour and ownership of the means of production. This happens throughout the economy, in a way that destroys craftsmanship, small ownership of productive land, etc., making exchange value prevail over use value and thus turning objectified labour into a property foreign to the worker.

In a more detailed manner, this process of alienation is also observed when theories on surplus value and profit are discussed in the *Grundrisse*. It describes how, in pre-capitalist conditions, with craftsmanship, there is a concern for the quality of the product, and a relationship where the master craftsman of the workshop occupies this position precisely because of his proficiency in what he produces. It becomes evident how, even in conditions characterized only by absolute surplus value and formal subsumption of labour under capital, the organization of production aimed at the production of value already modifies the role of the worker in the labour process. From the moment the objective shifts to increasing the number of workers capable of reproducing the same activity to generate more surplus value, the worker loses his relationship with the particular capacity of immediate labour.

The principle of developed capital is precisely to make special skill superfluous, and to make manual work, directly physical labour, generally superfluous both as skill and as muscular exertion; to transfer skill, rather, into the dead forces of nature (MARX, 1973, p. 587)

The grouping of workers around a single production process allows the capitalist to appropriate the surplus value created by the labour that has been purchased, enabling production to aim at enrichment, whereas when isolated, workers maintain relative independence that allows them to produce for their own subsistence. Thus, capital requires a certain level of wealth concentration to already exist. Therefore, it becomes possible for capital to utilize the existing collective social powers of labour to appropriate absolute surplus value without needing to modify the labour process. At this point, formal subsumption predominates, as what is appropriated by capital remains only the product of labour:

Certain branches of industry, e.g. mining, already presuppose cooperation from the beginning. [...] In order to take over these works, capital does not create but rather takes over the accumulation and concentration of workers. Nor is this in question. The simplest form, a form independent of the

division of labour, is that capital employs different hand weavers, spinners etc. who live independently and are dispersed over the land. (This form still exists alongside industry.) *Here, then, the mode of production is not yet determined by capital, but rather found on hand by it.* [...] Their unification by capital is thus merely formal, and concerns only the product of labour, not labour itself. Instead of exchanging with many, they exchange only with the one capitalist. [...] The unification of their labours appears as a particular act, alongside which the independent fragmentation of their labours continues. This is the *first condition* necessary for *money* to be exchanged as capital for free labour (MARX, 1973, p. 586-587).

However, this product of labour appropriated by capitalists is increased in the production process due to the existing collective character of labour. Capitalists, therefore, need their production to be sufficiently large so that they can continue to expand their capital, requiring a sufficiently large mass of living labour to employ the dead labour mass obtained in means of production and still be able to multiply it. Thus, when the capitalist system begins to form, with simple cooperation, workers are still dispersed and are only formally coordinated around the product of labour. However, the need for grouping around the same capital in order to be able to appropriate the potentiated product that comes from the social force of labour causes capital to find a way to concentrate workers in the same place in a specific and arbitrary manner with manufacturing.

The concept of capital inherently contains the necessity of concentration, as it is a collective force that "rests primarily on the social powers of labour" (ROSDOLSKY, 1977, p. 236). Therefore, the separation between labour and the ownership of the product of labour is also necessary so that the worker is not used as an isolated individual. When selling their labour power, they are employed as a 'working organism' by capital, which combines and organizes their labour in a non-spontaneous manner with the aim of having at its disposal a potentiated labour capacity derived from collective and coordinated labour (ROSDOLSKY, 2001, p. 201). However, the limit of absolute surplus value still lies within manufacturing, determined by the natural limit of surplus labour, which is the number of simultaneous working hours possible for the working population to execute, so "at this stage the difference between the production of capital and earlier stages of production is still merely formal" (MARX, 1973, p. 769), and it is still possible to observe a simple proportion between use values and exchange values, even when the use value "may be purely imaginary, as e.g. with the Egyptian pyramids" (MARX, 1973, p. 770).

It is only large-scale industry that can definitively overcome the barrier of absolute surplus value, revolutionising the labour process by completely transforming the relationship between the worker and the means of production, with machinery taking the place of the worker and the worker's activity being regulated by the movement of machinery, reduced to an abstract activity (ROSDOLSKY, 1977). In the *Grundrisse*, it is

pointed out how with machinery, the knowledge and skills characteristic of labour used to improve productive forces appear as if they were qualities of capital. Labour appears as an accessory moment of the entire process seemingly commanded entirely by machinery; the worker then becomes superfluous and replaceable.

The worker's activity, reduced to a mere abstraction of activity, is determined and regulated on all sides by the movement of the machinery, and not the opposite. The science which compels the inanimate limbs of the machinery, by their construction, to act purposefully, as an automaton, does not exist in the worker's consciousness, but rather acts upon him through the machine as an alien power, as the power of the machine itself. [...] In machinery, knowledge appears as alien, external to him; and living labour [as] subsumed under self-activating objectified labour. The worker appears as superfluous to the extent that his action is not determined by [capital's] requirements (MARX, 1973, p. 693-695)

The role of science and knowledge is thus transformed along with the work itself. Individual labour appears as an appendix, while scientific thought assumes a coordinating role through machinery. As a result, the production process no longer appears as a labour process, for "“In no way does the machine appear as the individual worker's means of labour” (MARX, 1973, p. 692). In the *Grundrisse*, even though the term "real subsumption" is not used, it is already noted that it is no longer possible to consider the labour process as being subordinated to capital merely "formally" when machinery is introduced, once the labour process is completely transformed when capital relentlessly seeks to reduce necessary labour time and maximize its appropriation of surplus, such that the production process does not appear.

So, the emergence of industry marks a new link between science and the production process, with labour appearing as a technological application of science, while the very development of science is determined by its applicability in the production process, turning it into a "business":

However, the development of machinery along this path occurs only when large industry has already reached a higher stage, and all the sciences have been pressed into the service of capital; and when, secondly, the available machinery itself already provides great capabilities. Invention then becomes a business, and the application of science to direct production itself becomes a prospect which determines and solicits it. But this is not the road along which machinery, by and large, arose, and even less the road on which it progresses in detail. This road is, rather, dissection [Analyse] - through the division of labour, which gradually transforms the workers' operations into more and more mechanical ones, so that at a certain point a mechanism can step into their places (MARX, 1973, p. 704).

The machine enables the simplification of labour to the utmost extent possible, and science and its discoveries play a role in enabling this development, which explains the need for a certain level of advancement in the productive forces and the grouping of labour until the emergence of industry and the real subsumption of labour process are observed.



Thus, it is possible to perceive that the reflection on the subsumption of the labour process appears throughout the *Grundrisse* through historical analysis in which production and the appropriation of surplus are modified, taking on specific outlines in capitalism, distinguishing it from other modes of production, although it takes advantage of some existing characteristics. It is also demonstrated how the capitalist system turns the labour process into an application of scientific knowledge by making science serve capital itself, with the activities of workers becoming increasingly simplified and controlled by a scientific process external to them.

In part of the Manuscripts from 1863-1867, known as Chapter Six, the idea of formal and real subsumption of the labour process to capital is already formed. Formal subsumption occurs when the labour process becomes a means for the valorization process of capital, so that the capitalist appears as the leader and the labour process also becomes a process of exploitation of alienated labour. At this point, the basis of capitalist production utilizes existing labour processes, such as craftsmanship and small-scale agriculture. Formal subsumption may gradually change these labour processes, making them more intense, prolonged, or continuous, but without altering the real character of these works, which can only happen when the typically capitalist mode of production is established, which revolutionises not only the relations between agents of production but simultaneously the type of labour and the labour process as a whole (MARX, 2022). Without this revolution, the maintenance of a pre-existing mode of work is restricted to obtaining absolute surplus value, i.e., prolonging working time.

In this sense, as in the *Grundrisse*, it is observed how the existing social productive forces of labour are used by capital even when there is no process of real subsumption of capital. However, there is a more direct elaboration on how socialized labour works, the process by which various products of knowledge are applied to immediate production, especially on a large scale. When moving towards real subsumption, it is necessary to recognize that there is a direct subordination of the labour process to capital, which is a general characteristic of formal subsumption. However, this only serves as a basis, as it is accompanied by a transformation of the real nature of labour, enabling the development of relative surplus value through the revolution of the mode of production and labour productivity. This leads to the development of social forces of labour, allowing science and machinery to be applied to immediate production with labour on a large scale (MARX, 2022, p. 104). At the same time, real subsumption causes the entire development of the productive force of socialized labour to not appear as belonging to labour. Relative surplus value, as previously discussed, changes the entire basis of production relations,

especially between capitalist and wage labourer, and is responsible for the mystification and presentation of the productive forces of labour as if they were the productive forces of capital.

In Book I of *Capital*, the formal subsumption of the labour process under capital appears in the discussion of the section on "*Production of Relative Surplus-Value*" where cooperation, division of labour, and manufacture are discussed in a more systematic and ordered manner than in the *Grundrisse*, until machinery and large-scale industry are reached, where the specific form of capital is found:

In handicrafts and manufacture, the worker makes use of a tool; in the factory, the machine makes use of him. There the movements of the instrument of labour proceed from him, here it is the movements of the machine that he must follow. In manufacture the workers are the parts of a living mechanism. In the factory we have a lifeless mechanism which is independent of the workers, who are incorporated into it as its living appendages.[...] Every kind of capitalist production, in so far as it is not only a labour process but also capital's process of valorization, has this in common, but it is not the worker who employs the conditions of his work, but rather the reverse, the conditions of work employ the worker. However, it is only with the coming of machinery that this inversion first acquires a technical and palpable reality (MARX, 1976, p. 548).

It is then, in the part where the discussion revolves around "*Production of Absolute and Relative Surplus-Value*" that this argumentation is systematized in terms of real subsumption, understood as the moment when relative surplus-value becomes the general form of the production process, while also reiterating the association between absolute surplus-value and formal subsumption, when production methods have not yet been revolutionized. In Marx's words:

The production of absolute surplus-value turns exclusively on the length of the working day, whereas the production of relative surplus-value completely revolutionizes the technical processes of labour and the groupings into which society is divided. It therefore requires a specifically capitalist mode of production, a mode of production which, along with its methods, means and conditions, arises and develops spontaneously on the basis of the formal subsumption [Subsumption] \* of labour under capital. This formal subsumption is then replaced by a real subsumption. [...] The specifically capitalist mode of production ceases in general to be a mere means of producing relative surplus-value as soon as it has conquered an entire branch of production; this tendency is still more powerful when it has conquered all the important branches of production. It then becomes the universal, socially predominant form of the production process (MARX, 1976, p. 645-646).

## **FINAL REMARKS**

The purpose of surplus value production, as a specificity of capitalist production, ties it to a historical process of concentrating and utilizing collective labour powers through the grouping of various workers simultaneously. As the valorization process needs to exist continuously, this conditions technical progress to be used as a tool for

developing the productive forces of capital, leading to "a dynamic of increasing interconnection between scientific activity and productive activity" (PAULA; CERQUEIRA; ALBUQUERQUE, 2002, p. 831). The role of science is transformed within the labour process itself, as with real subsumption where the individual worker appears as an appendix, scientific thought takes on a coordinating role. There is a new link between science and the production process, with labour appearing as the technological application of science, while the development of science itself is determined by its applicability in the production process, turning it into a "business."

In this process, the development of productive forces is expected to be accompanied by an increase in the quantity produced and a diversification of production branches. There is an expansionist tendency of capital expressed through the growing real subsumption of branches that were until then formally subsumed to capital. Additionally, it is possible for capital to expand in a way that imposes real subsumption from the outset on branches that had no capitalist organization (MARX, 2022, p. 93–105). Thus, relative surplus value as the general form of production demands that surplus labour increases both quantitatively and qualitatively, prompting capital to utilize any available means to facilitate the appropriation of new branches and types of concrete labour. Science then becomes a significant tool.

Therefore, the expansion of surplus value production can be understood as a process of progressively applying scientific knowledge to promote the revolution of productive forces and the labour process. From this reflection, it is possible to revisit the question posed in this article about capital's ability to command the labour process while maintaining its unity with the valorization process in the face of technological-informational changes observed since the 1970s.

The "immaterial production" encompasses both intellectual labour that manages to acquire materiality and those whose production occurs at the moment of consumption. It is argued that contrary to the notion that it would have become impossible for capital to appropriate work processes that are increasingly interconnected yet geographically dispersed, ICTs can modify "immaterial production," both through the real subsumption of existing "immaterial" work processes and through the real subsumption of new work processes emerging from technological advancements. If the process of real subsumption presupposes a separation of the individual worker from their means of production, with the capitalist making private work and collective work, utilizing social labour powers to appropriate unpaid labour from the production process, with the technological revolution process, this has been deepened.

The centralization carried out by lean platforms, such as Ifood and Uber, for example, grouped various isolated workers, centralized them through an application, and thus began to control the entire work process of these workers. The working hours are controlled, the regions to be served, the number of deliveries or rides to be made to maintain the link and remuneration through the application. Information and communication technologies, the use of data and the internet, made it possible to develop a tool used to appropriate existing labour, such as food delivery and individual transportation, and thus employ them on a larger and external scale, enabling the appropriation of unpaid surplus labour.

On the other hand, the digital infrastructure also enabled the emergence of new commodities, which required the organization of other work processes, which can be classified in various ways. As an example, Zukerfeld (2022) uses "platformization" to describe various work processes that occur *behind* and *through* platforms, existing work before technological advances, and new ones that emerged with them. Although there is no consensus on terminology about the types of work used, in general, Zukerfeld's table is useful for rethinking how work processes are organized, even though they often appear invisible to consumers.

**Table 1** – Types of work and labour in for-profit platforms

Type of Work and Labour	Sub-type of Workers	Goods and Services Produced	Examples
Behind the Platform	Service Workers	Services	Warehouse and delivery workers of Amazon
	Industrial Workers	Physical Goods	Hardware builders in Amazon
	Informational Workers	Informational Goods	Software developers in Amazon
Through the Platform	Self-employed	Physical Goods and Related Services	Airbnb hosts, Amazon sellers
		Informational Goods	Authors sharing music through Spotify App developers for Play Store or App Store
	Gig Labour	Services	Delivery workers of Deliveroo; Uber drivers; TaskRabbit cleaning workers

		Informational Goods	Software developers, writers, audiovisual content producers, and microtaskers on Upwork, and Freelancer Crowdworkers on Amazon Mechanical Turk
	Prosumers	Informational Goods	Content creators for Facebook or YouTube; Data producers for all platforms
		Audience Labour	Audiences paying attention to ads on Facebook or Youtube

**Source:** (ZUKERFELD, 2022, p. 105)

Concurrently, capital imposes limitations on the development of productive forces that are evident in its expansion process, by attempting to link the growth of absolute surplus value to that of relative surplus value. A machine is only introduced into a particular production process if the labour needed to produce it is less than the labour used before its creation, so that an improvement in productive forces implies a decrease in the total sum of social labour. There is a reduction in absolute surplus value accompanied by an increase in relative surplus value, as the total quantity of articles produced must grow while the number of workers decreases in the sector where it is introduced. Thus, from the moment when relative surplus value is the general form of production, a conditioned development of productive forces is established, leading to a decrease in the final amount of value produced by reducing the number of employed workers, progressively increasing the constant capital at the expense of variable capital. Hence, capital encounters a constant difficulty in reducing the necessary labour time and the unpaid labour time appropriated by it.

This contradictory form in which technical progress is placed in capitalism appears in competition in the form of the law of the tendential fall in the rate of profit, leading capitalists to constantly vie for ways to obtain extra profit to appropriate a greater share of social surplus value. This behaviour, in turn, has consequences for the functioning of the capitalist economy, which can be observed at various crucial moments since the 1970s, functioning as countervailing tendencies to the profit decline and must also be analysed.

Thus, it was sought to demonstrate how there is no contradiction between "immaterial" commodities, intellectual labour, and typically capitalist production; on the contrary, these forms are modified by the insatiable process of capital valorization, which imposes its use as a tool for the development of capital's productive forces. If they could be used to reduce working hours, make processes less mechanical, and less repetitive, this

only happens to the extent that there are benefits to the accelerated accumulation process of capital. The link between science and the productive process is constantly renewed and conditioned by these terms.

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