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Platform Battlefield:
Digital Infrastructures in Capitalism 4.0

Digital platforms are a global phenomenon that has developed quickly in just over ten years (Helmond 2005; Gurumurthy, Bharthur, and Chami 2019). Since the outbreak of the 2007/2008 financial crisis, the processes of platform capitalism (Srnicek 2016) and the so-called Industry 4.0 (Schwab 2016)—characterized by massive use of digital technologies, a logistical rationality, and the adoption of "logged labor" (Huws 2016)—have, together, progressively colonized forms of work and consumption. These processes are transforming not only the economy, but also forms of life, social relations, and the political realm. Yet, we believe that the rhetoric on the remarkable character of platforms must be interrogated since they are not born out of a temporal-spatial vacuum but rather express the convergence of a series of long-term global trends.

In fact, at the planetary level, we are witnessing the restructuring of many productive processes through the adoption of innovative technologies. The push toward digitalization has gained great traction with the outbreak of the pandemic: there has been a rapid spread of *smart working* as a substitute for office work, and of platform services instead of neighborhood shops. Digital technologies are

attributed with powerful expectations to restore a new normality (McKinsey and Company 2020). Alongside platform work—work carried out on or through software installed on a smartphone or computer—there is also a growing platformization of work, that is, the adoption of characteristics of platform work in other productive activities (for instance, the rhetoric of self-entrepreneurship now present in all sorts of professions). In other words, platform capitalism is acquiring an increasingly hegemonic role within processes of valorization, so much so that we could say we now live in an age of platforms. The development and growing imposition of this paradigm goes beyond the confines of productive activities and encroaches upon the time and forms of life, especially in the urban spaces where the presence and effects of digital platforms are most evident.

But the overlap of productive and reproductive dynamics is not a new phenomenon, and one should not fall into the temptation of conferring a totally innovative character to platforms—for instance, see the work of Mezzadra and Neilson (2013, 2015) concerning the blurred borders between life and work, extractivism, and commodification. Digital infrastructures such as platforms are part of a more general tendency toward the valorization of social reproduction (Huws 2003, 2014, 2017; Armano, Murgia, and Teli 2017) while simultaneously greatly broadening its scope. In this too, the pandemic context is contributing to a new wave of commodification of social reproduction by means of digital technologies: many care services—previously more or less structured along the lines of a gendered division of labor—are increasingly incorporated in platforms and their ways of restructuring the processes of production. At the same time, platforms adopt some of the characters of the labor of care—for instance, the informality of labor relations—and widen its scope to other segments of the workforce.

Moreover, the digitization of productive processes does not entail the dematerialization of labor. Instead, platform capitalism operates a general deterritorialization or reterritorialization of productive processes: some functions move to the inner realm of the digital (not only those linked to the control of labor power, but also many management activities), while others are relocated in physical spaces that are more or less defined (from data centers to click farms). It is, however, in urban spaces that the effects of platforms become particularly tangible and evident—the spread of digital services to the formation of labor force contingents, passing through the shifting borders of production, circulation, and consumption. Without renouncing the principle of scalability proper to a variegated capitalism from the standpoint of geographical spaces, and without conceiving of the city in excessively defined terms (Castells 1999; Brenner 2013; Brenner and Schmid 2001, 2014; Merri-

field 2013), we regard urban spaces as the arena within which platforms operate as infrastructures (Van Dijck, Poell, and de Waal 2018) that not only facilitate the bringing together of supply and demand or the transmission of data but also produce concrete effects in terms of habits, needs, and conflicts. In other words, the "simultaneous convergence of platforms and infrastructures" (Plantin et al. 2018: 301) must be analyzed also and above all in terms of the effects they produce on subjectivity, not only as devices of subjugation but also as what is at stake in practices of subjectivation. The supposed neutrality of processes of technological innovation must give way to an analysis of the social relations determined in and against platforms.

With the aim of contributing to a more general process of development of a critique of platforms—one that brings together workers' struggles, social counter-conducts, co-research, new institutionalities—we will concentrate on three nodes: platforms as infrastructures, platforms as battlefields, and a politics of counter-platforms.

Platforms as Infrastructures

In his actor-network theory, Bruno Latour put forward a theory of the relation between technologies and objects to fully understand the social behavior of human beings. According to Latour (2008: 166), things, or more generally non-human elements, are an irreducible part of society, the "missing masses" that traverse and determine it: "The paradox of technology is that it is thought to be at one of the extremes, whereas it is the ability of the engineer to travel easily along the whole gradient and substitute one type of delegation for another that is inherent to the job." Understood as such, technologies can be read in their social character, which is, after all, also always and inevitably a political character. It seems to us that platforms very clearly represent this perspective. Far from being "simple" private companies or marketplaces, they take on the form of actual "non-neutral digital infrastructures" that determine social, political, and economic relations.

The heart of contemporary global society, its connective center, is undoubtedly digital. The web is articulated by the structure of platforms such as Google, Amazon, Facebook, Apple, and Microsoft (collectively referred to as GAFAM), but also Alibaba, Tencent, and ByteDance. It is a galaxy so heterogeneous that it needs to be analyzed starting from a perspective able to de-Westernize its gaze to grasp its simultaneous emergence on multiple latitudes (Davis and Xiao 2021). Thanks to these, a multitude of what Van Dijck, Poell, and de Waal (2018) name "predatory platforms" operate and prosper taking up digital and social as well as market realms. The space of the internet,

borne out with the often utopian traits of a free and even anarchic place, is increasingly becoming more regulated and subjected to infrastructures that are useful to capital to spread what Mezzadra and Neilson (2019: 65) call "the frontiers of its valorization." Digital space can be hybrid and permeate other realms. In this way, platforms operate while searching and creating new spaces geared toward the extraction of value from the field of social relations, which they colonize and transform. In digitalized space—made analogically by codes, ocean cables, servers, hard disks etc.—platforms are becoming hegemonic, and this hegemony is also reflected in their ability to determine transformations in physical spaces. Moreover, they are more explicitly assuming a political character: like all other infrastructures, platforms too "have politics."

The politics of infrastructures is now a widely accepted object of study. An important text in this respect is certainly Langdon Winner's (1980) "Do Artifacts Have Politics?" Winner's answer to the question in the title was clearly yes, and to demonstrate it he used the remarkable example of Robert Moses, urbanist and designer of modern New York. In his planning of the Big Apple, Moses designed the tunnels leading to Long Island beach with clearances so low that buses could not use them. Public transport, used especially by the working class and lower income classes, thus had no access to the residential areas of Long Island, which was only accessible to car owners. Another notorious example of a political use of infrastructures was Baron von Haussmann. Tasked by Napoleon III, he operated a drastic renovation of Paris in the 1850s and 1860s. Huge boulevards and wide roads were carved out of the medieval center. New communication paths literally straightened up the winding lanes that had given shelter to the revolts of 1848: Haussmann's planning had the express purpose of destroying an urban landscape that had incubated citizens' insurgencies, and constructing access routes more conducive to the mobility of commodities and state armies.

Although the two models here cited are mainly historical in character and linked to the urban planning of metropolises, many contemporary examples have demonstrated how infrastructural planning involves a political vision that often generates conflict, from the indigenous people's opposition to the Dakota Access Pipeline in the USA and the Canadian Coastal GasLink Pipeline, to the struggles against high velocity trains and gas ducts in Italy (No Tav and No Tap), and to the many instances of friction that characterize the new Chinese Silk Road or the many infrastructure projects in Latin America included in the huge IIRSA plan. On this issue, anthropologist Brian Larkin (2013: 329) is enlightening:

> As several scholars have pointed out, liberalism is a form of government that disavows itself, seeking to organize populations and territories through technological domains that seem far removed from formal political institutions. . . . Even the free flow of goods that constitutes a *laissez-faire* economy rests on an infrastructural base that organizes both market and society. . . . Infrastructures are interesting because they reveal forms of political rationality that underlie technological projects and which give rise to an "apparatus of governmentality"

Interpreting platforms as infrastructures in this genealogical perspective seems a useful lens through which one can both investigate platform urbanism (Barns 2020) and, more generally, frame their role in the emergence of "capitalism 4.0"—the form of capitalism that emerged after the crisis of 2007/2008. Its special feature appears to be the construction of a new urban-industrial environment where different forms of exploitation and accumulation come together. In fact, platforms define cycles of "primitive accumulation" in that they capture the value of cooperation in metropolises while expressing concurrent forms of "formal" subsumption through the exogenous management of a craft-like workforce that uses its own means of production. In addition, they produce "real" subsumption through an algorithmic organization of labor. The infrastructures of the new 4.0 environment being constructed find their symbolic and most "tangible" expression in the platform but also need to be seen as part of a wider process of transformation that goes from the most evolved robotics to big data, from the cloud to the Internet of Things, from virtual reality to artificial intelligence, all converging to redefine the modes of reproduction of systemic cycles. This scenario of an ecology capable of integrating the human and the machinic in the digital and biochemical realms redefines the organizational logic of labor and society, introducing new factors into long-term processes.

Therefore, we propose to locate the current shift within the materialist terms of an emerging new dimension of division of labor in the history of capitalism. While doing this we try to avoid the teleological risks of stages of development, and instead grasp how, in the midst of different paradigms, elements of transformation can be singled out. In this respect, technological evolution—generally considered as the privileged lens for viewing the current shift—is only one observation point, possibly even a secondary one when considered within a more general process of the abstraction of labor and its division (and antagonisms) in an increasingly complex social machine. Or rather, from a different perspective, we might say that the technological leap—that is,

machines and fixed capital—is increasingly absorbed within variable capital (labor power), and this gives rise to ambivalent tendencies that we will analyze below. Or to put this differently, some machinic functions are absorbed by subjects just as some human activities are made machinic. From another standpoint, we are also confronted with the workshop of a *planetary metropolis* defined by growing levels of abstraction and machinic integration—financial, logistical, and digital.

Platforms as a Battlefield

Let us look closer into the subjective aspects—social relations—within which this reorganization—technical composition—of capital is given. Following a methodology inspired by *operaismo*, we believe that the process of understanding a social phenomenon also and above all goes through (a) the fractures it determines and (b) the positioning of the subjects that define these fractures from within. In other words, the growth of platforms as infrastructures and their potential to be generalized at the global level is certainly not a neutral and pacified process but goes through a confrontation and a clash with different subjectivities, whether they are located within the immediate realm of agency of platforms, or indirectly affected by their expansion. Let us try to explain this shift from another angle. When we presented platforms as infrastructures, we tried to highlight their ecosystemic character, the fact that they produce social environments where different subjectivities and forms of power take shape. These subjectivities, however, are not only created by platforms, they can also take an active—thus critical—role toward them. Moreover, the infrastructural character of platforms should not lead us to see them as abstract objects, free of spatiality and temporality. Platforms develop by entering a process of reciprocal exchange with other temporalities that have sedimented in specific geographies. The extreme resilience of platforms is perhaps one of the main characters of this business model, one that also begs the question of how this spatiality and temporalities interact with them.

Here we are going to dwell on the processes of subjectivation toward platforms by trying to sketch a spectrum of potential conflictual relations that range from total refusal to a recognition of their role. These positionings can be embodied by different subjects, each of whom has its own practices and objectives, depending on their specific respective features (social, geographical, etc.) and focusing on a particular aspect of said platform.
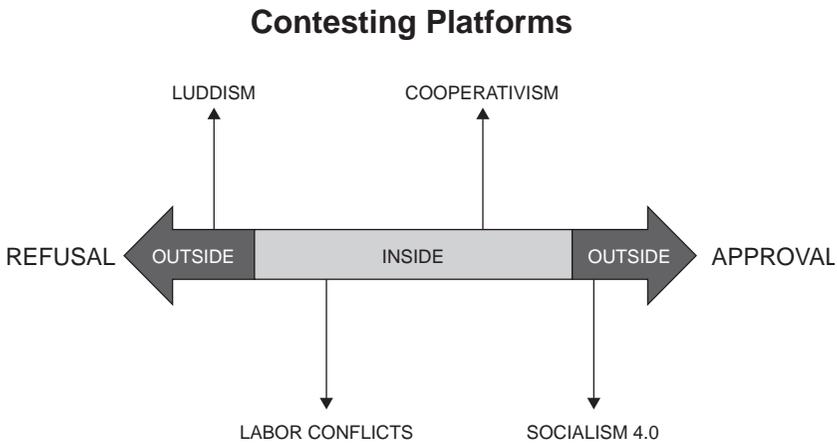
Contesting Platforms

Figure 1. Spectrum of potential conflictual relations with platforms.

Initially we can identify four main positionings along the spectrum: outright refusal, moderate refusal, moderate consent, and outright consent. At the center of the spectrum we can place platform cooperativism and labor conflicts: the two share the same perimeter they develop in, that is, the labor process on the platform. At the farther ends, we find the neo-Luddism of subjects that refuse platforms *tout court* and the socialism 4.0 of those who propose to collectivize the digital infrastructures that have by now become "essential" (see Figure 1). In both cases, conflicts develop outside of the platform and question its existence. Let us analyze these positions in detail.

Starting with those directly involved in the platform labor process, it is possible to note how over the years—from the north and south of the globe, from Great Britain to Ecuador and passing through Hong Kong—a renewal of union activism has proceeded hand in hand with the development of platforms and the production of specific subjectivities of digital labor such as riders or drivers.[1] The first point we are eager to underline is that this conflict has undermined the rhetoric of self-entrepreneurship that is usually deployed by platforms to name their workforce. In this perspective, platforms are nothing but a marketplace within which largely individual micro-enterprises can be found. We would therefore be witness to the end of contract employment[2] and the forms of exploitation that have historically been ascribed to it; now, human capital is allegedly free to valorize itself autonomously and creatively without disciplinary constraints. Yet, living labor, captured by the platforms,

does not always coincide with this perspective, but instead experiments with collective forms of organization and demands (Hidalgo Cordero and Salzar Daza 2020). Labor conflicts bring to light, first and foremost, the vertical nature of the relationship between living labor and platforms: while these present themselves as shared spaces that, if anything, fulfil a role of coordination and moderation, platform workers' conflicts tend to highlight the role of power these exert and the asymmetries they produce in terms of control and knowledge of the productive process. This kind of conflict—aimed at gaining labor rights and redistributing profits—unveils the manner in which the rhetoric of self-entrepreneurship mainly acts in the terms of a destructuration of labor.[4] At the same time, platform unionism seems to question the epicenter of the power of platforms, that is, the algorithmic management of workflows. Blockages and strikes can be seen as forms of struggle at the level of circulation that point toward the sabotage of the logistical chain of information, commodities, and people.

Still within the production process of platforms, it is possible to highlight how the cooperative movement has gained a new momentum precisely within the forms of the digital enterprise. The modern tradition of cooperativism was born in the 1800s around the factory system in the attempt to democratize its management, putting in the hands of the workforce the chance of organizing both the productive process and the circulation of commodities, as well as the distribution of profits. This tradition is being renewed today in an attempt to democratize the management of platforms through collective and democratic forms of enterprise, as well as through an open and shared management of the means of production, that is, algorithms and data. Thus, platform cooperativism (Scholz 2016) identifies in this new kind of infrastructure a problem as much as an opportunity. Existing forms of organization of the productive process are criticized because of their extreme centralization and opacity, as in the union movements. At the same time, digital technologies are recognized for their potential to democratize decision-making processes and their productive capacity. To sum up, the question is one of changing hands of the ownership of the company, from the capitalist to the workforce. In other words, platform cooperativism tries to recover for platform workers the social cooperation that the platform absorbs and usurps.

Leaving aside the subjects internal to the productive process (using a narrow definition of digital labor) we can identify two more types of conflict against platforms. We might label a form of neo-Luddism (Jones 2006) all those protests that see the platform as a subject that invades—one working

sector, one urban space—and that must be expelled. From anti-gentrification residents' committees against Airbnb (Pinkster and Boterman 2017; Del Romero Reanau 2018; Wachsmuth and Weisler 2018), to taxi corporations against Uber (Adebayo 2019), in all such cases the presence of platforms is perceived as external and threatening. Refusal is often not total, nor does it criticize digital innovation in general, but rather expresses a "not in my backyard" logic. One of the aspects highlighted by these protests is the proliferation and stratification of forms of work within capitalism that, between them, can not only coexist but also enter into conflict. The processes of what Marx called primitive accumulation[4]—which mainly define the subjective relationship between command and living labor—are not exhausted in an initial moment, but perpetuated within a constant innovation of the capitalist mode of production that can use specific segments of capital or forms of life as a threshold to overcome. In other words, the forms of technological innovation are never general but above all punctual, and while developing they create fictions with both different forms of organization of command (i.e., traditional tourist companies vs. Airbnb) and different labor subjectivities (i.e., licensed taxi drivers vs. Uber drivers). The transition thus becomes a moment where relations between different sociohistorical stratifications are redefined without necessarily disappearing but instead finding different forms of hierarchization and coexistence.

Finally, it is possible to identify what goes by the name of socialism 4.0 (Peters 2020) in the reenactment of instances of collectivization of the modes of production proper to the socialist tradition. There are two main developments of this position: in a first case, what is demanded is a nationalization of specific platforms; in a second, there is a more general collectivization of data management. In fact, during the last few years, there have been many calls for the state ownership[5] of some platforms emerging from the recognition they have come to play the role of essential social infrastructures. This demand highlights the division between public and private realm—or rather, its falling apart—along which these operate: on the one hand, while some platforms seem to take on a public role and function as a common space where our social, economic, and political relations unfold, on the other, their ownership regime remains anchored to the forms and prerogatives of private property. In other words, the ability for social and economic planning seems to have moved from the state to the private sphere of Big Tech companies (Morozov 2020). The emerging political question is this: is it right that an infrastructure so fundamental to social reproduction is managed by a subject that is not accountable and not guided

by the logics of the common good. At the same time, demands for collectivization can be geared not so much toward a specific platform but instead toward all assets that determine their power relations with regard to living labor, beyond the fact of constituting a primary good on which their wealth is based. In other words, in digital capitalism, the ownership of the physical means of production is less and less central when compared to the control of some immaterial goods such as algorithms, big data, and patents. The centrality of these goods is articulated in another form of digital socialism that points to a decentralization and democratization of their management (Morozov 2020).

Counter-platform Politics

Having drawn this map of potential forms of resistance within a new technical composition of capital that we name 4.0, let us return to the more general question of how to frame the relation between machines and labor, platforms and the cybertariat. In fact, in 4.0 there is more of a zone of indistinction between labor time and life time, between living labor and labor that is incorporated into machines (or between variable and constant capital); in this respect it seems to us that it becomes impossible to discern a separation between *exploitation* and the theft of time and *autonomy* (both actual and potential). For Marx, each machine is always the reterritorialization of previous power relations. The division of labor is thus molded by social conflicts and workers' resistance, and technological innovation proceeds in the same way. Parts of the social "mechanism" adjust themselves to the technical composition of labor, depending on their level of resistance and conflict. Machines are forged by social forces and evolve together with them. From this standpoint, digital platforms are a useful kaleidoscope. They advance by concatenations of physical and abstract machines, they spread throughout the metropolis, they emerge by capturing preexisting forms of cooperation that they subsume and capitalistically potentiate. However, they also constantly coevolve and innovate thanks to acts of subtraction, resistance, and refusal, but also another different use of the labor power of the platforms themselves. In short, they are machines that embody the diagram of power relations between classes. Innovation proceeds in a dialectics between a living labor that moves, shapes, and instructs new generations of machines, and the machine-device or *dispositif* that uses living labor to constantly change. In this context, platforms are machines par excellence, dynamic

ones that do not capture a particular power relation but constantly reformulate power relations. Moreover, machines and the innovation of productive processes invest not only the labor process but also and above all the social conditions of the overall production and reproduction of capital. Digital platforms, in this sense, retrace the contours of social conflict in its less visible and molecular form, constantly crystallizing and changing the actions and behavior of those who move within them and at their borders. At this level of interpretation, we can locate a threshold of *refusal of labor* in 4.0, whose boundaries between individual and social brain, between living labor (and its knowledge) and its turning into dead labor are extremely variable and always in conflict.

The question of technology is subjected to this development. The digital platform and recent technologies are machines trained to extract value but also places of mediation and conflict between labor and capital. Workers' struggles move *through* technology and the world of machines in a complex mechanism where opposite movements overlap and come into conflict. In this respect, we believe that platforms outline a strategic *battlefield* in which trends of development unfold and with respect to which possible forms of alternatives that do not bow to capitalism can take shape. We refer to paths and potentials that open up on new forms of subjectivation, where platforms—seen not as simple digital artifacts or autonomous objects, but as the dynamic configuration of social forces that shape them—are not a technical abstraction. Rather, they emanate a physical subjectivity beyond themselves, interacting and constantly changing, starting from the social interactions that they construe and in which they are inserted. Clearly, software and digital codes mainly function as machines that augment and accumulate surplus value, but we believe that in addition to the realms of sabotage and a "workers' management" of the algorithm, it is necessary to also consider the possibility of *counter-platforms*, that is the formation of algorithmic subjectivities of rupture within the integrated planetary metropolis that is emerging. These suggestions for research require a collective effort of inquiry on the worker 4.0 and the conflicts being produced today. However, this emerging field is particularly productive because the greatest challenge for a counter-platform politics is that it is not limited to sector-specific struggles. If, however, as we discussed, platforms are configured as infrastructures of the present, then acting on them demands a redefinition of trends in labor relations, forms of social reproduction, and even of the digital/physical environment.

Notes

The authors developed analyses and conclusions through project deliverables D1.3 "Report on the Socio-Historical Impact of technology in the Labour Market" and D2.1 "Report on the Literature Review." Although all authors contributed substantially to the final essay, Mattia Frapporti made key contributions to "Platforms as Infrastructures," Maurilio Pirone made key contributions to "Platforms as a Battlefield," and Niccolò Cuppini to "Counter-platform Politics."

1   With this, we are not claiming that riders and taxi drivers did not exist before platforms. We are rather underlining how these labor figures have seen a growth thanks to platforms, especially in urban areas.

2   Here we adopt this expression in a sense broader than its labor-rights meaning, to indicate the vertical relation between capitalist command and labor power beyond specific contractual relations.

3   While digital technologies allow for a capillary control and organization of the productive process, the rhetoric of self-entrepreneurship makes it possible to make the labor relation informal, which deprives workers of the usual protections of wage labor and offloads on them part of the responsibilities and costs of business.

4   On the constant return of primitive accumulation, see Rosdolsky 1977, part 3, paragraph 20.

5   According to Paris Marx (2020), the "government needs to act not just to protect those frontline workers, but to ensure it has an infrastructure to respond to the needs of people across the country as the pandemic situation deteriorates. The response should be to nationalize Amazon and integrate it with USPS." A similar position is sustained by Nick Srnicek (2017): "in the past, natural monopolies like utilities and railways that enjoy huge economies of scale and serve the common good have been prime candidates for public ownership. The solution to our newfangled monopoly problem lies in this sort of age-old fix, updated for our digital age. It would mean taking back control over the internet and our digital infrastructure, instead of allowing them to be run in the pursuit of profit and power."

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