

# *Understanding work in the online platform economy: the narrow, the broad, and the systemic perspectives*

Article

Accepted Version

Garcia Calvo, A. ORCID: <https://orcid.org/0000-0001-8163-1637>, Kenney, M. and Zysman, J. (2023) Understanding work in the online platform economy: the narrow, the broad, and the systemic perspectives. *Industrial and Corporate Change*. ISSN 1464-3650 doi: 10.1093/icc/dtad005 Available at <https://centaur.reading.ac.uk/109646/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

To link to this article DOI: <http://dx.doi.org/10.1093/icc/dtad005>

Publisher: Oxford University Press

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

[www.reading.ac.uk/centaur](http://www.reading.ac.uk/centaur)

**CentAUR**

Central Archive at the University of Reading  
Reading's research outputs online

**Understanding Work in the Online Platform Economy: The Narrow, the Broad, and the  
Systemic Perspectives**

Angela Garcia Calvo

Assistant Professor, Henley Business School

&

Research Associate

Berkeley Roundtable on the International Economy

Martin Kenney

Distinguished Professor

Community and Regional Development

University of California, Davis

&

Co-Director

Berkeley Roundtable on the International Economy

John Zysman

Professor Emeritus

Department of Political Science

University of California, Berkeley

&

Co-Director

Berkeley Roundtable on the International Economy

**Oct 13, 2022**

## **Abstract**

This critical review of research on platform-mediated work argues that platform work studies are too focused on gig and remote work platforms. We introduce a framework that identifies three perspectives on how platforms reorganize work: narrow, broad, and systemic. This framework is used to examine the impact of platform-mediated work on four different aspects of work: management power, work processes, social protection and labor rights, and skills and career prospects.

**Key words:** platform economy, labor, work, value creation, skills, platforms

**JEL classification:** J0, O1, O3

## 1. The Impact of Platforms on Platform-Mediated Work

Online platforms are virtual places or infrastructures that intermediate transactions and other valued exchanges of goods, services or data/information (Cusumano et al. 2019; Plantin et al. 2018).<sup>1</sup> They represent a new institutional form that differs from both markets and hierarchies (Williamson, 1975) and network structures (Powell, 1990), though they have features of all three (Kretschmer et al. 2021; Frenken et al. 2020). As platforms have become pervasive (Kenney and Zysman, 2016; Srnicek, 2017; Van Dijck et al. 2018), there has been an explosion of interest among academics and policymakers in how platforms mediate the organization of work, value creation, income generation<sup>2</sup>, power relationships, and institutional structures (Cenamor & Frishammar, 2021; Cioffi et al. 2021; Gawer, 2014; Jacobides et al. 2018; Petit and Teece, 2021). However, most studies focus on a small number of highly visible platforms that offer either services delivered remotely or in-person (Urzin Brancati et al. 2020; de Groen et al. 2021; ILO, 2021; Kenney et al. 2021; Kilhoffer et al. 2020; Timko and van Melik, 2021; Wood et al. 2019), while excluding an enormous range of economic activities that are mediated by platforms, affected by platforms, or created by the platform firms. As a result, analyses underestimate the impact of platforms on work and highlight effects derived from certain types of platform-mediated work, while ignoring others, possibly leading to biased conclusions that might lead to underestimating the true scale and scope of the impact of platforms on the nature and conditions of work.

We address this gap by introducing a framework that presents three analytical perspectives on platform work: *narrow*, *broad*, and *systemic* to capture the pervasive nature of platforms. The narrow perspective reflects the view that most of the literature has taken on

---

<sup>1</sup> We define an online platform as a virtual location that intermediates transactions or exchanges by two or more sides. Thus, Amazon selling goods from its warehouses to customers is e-commerce but not a platform-mediated transaction.

<sup>2</sup> We thank Laura Tyson for pointing out the importance of “income generation”, rather than traditional compensated “employment” as an outcome of platform-mediated value creation.

platforms and includes a limited range of remote and in-person monetized work mediated by these highly visible labor platforms. The broad perspective adds a larger set of income-generating activities mediated by platforms, including the work of platform vendors, creators, and influencers. The systemic perspective expands the view to include labor that is not monetized by platform users, direct employment created by platform firms, and work in wide range of legacy industries affected by platforms. We use our definition of the broad perspective to discuss the impact on online platforms on the nature and the allocation of work, management power, work processes, and skills, and to pose wider questions about institutions and the ability of national economies to provide economic opportunity.

The framework we propose, and our conceptual analysis provide a more comprehensive and nuanced perspective on the effects of the wide-scale adoption of online platforms on labor. Our contribution speaks to scholars interested in the transformation of capitalisms, new institutional forms for creating and extracting value, and the impact of the platform economy on work, employment, and income generation. The paper is also valuable to policymakers interested in regulating platform work. The diversity of value-creating activities conducted across online platforms means that organizing and describing such activities will help identify research problems and the difficulties state actors might have in regulating work conditions.

The paper is organized as follows. Section two introduces the concept of platform work and our three perspectives. Section three uses the broad perspective to discuss four spheres that are being affected by platform-mediated work: management power, work processes, social protection and labor rights, and skill development, and the direction in which different types of platform work are affecting them. The final section synthesizes these themes, discusses their policy implications, and outlines future avenues for research.

## 2. Understanding Platform Work: Narrow, Broad, and Systemic Perspectives

The expansion of online platforms accelerated in the early 2000s, especially with the introduction of the smartphone and the widespread use of cloud services. In 2021, seven of the world's ten most valuable publicly traded firms were platforms.<sup>3</sup> This includes large or “gatekeeper” platforms such as Facebook and Google, both of which exceed two billion monthly active users, but also a plethora of other industry vertical platforms. Amazon has fewer users, but in many of the countries where it is active it controls in excess of 40% of all e-commerce. As platforms as a business model have matured, their number and their presence has expanded over ever greater expanses of economic activity (Gawer, 2021b, Ozalp et al. 2022). The enormous heterogeneity of platforms and national institutional environments- means that there is a dearth and statistical analyses that quantify their impact. This prevents us from providing a comprehensive picture. However, existing studies suggest that their number and economic relevance has grown rapidly. For example, de Groen et al. (2021) identify 516 active platforms and an additional 74 inactive platforms in the EU27 alone, ILO (2021) found 777 active labor platforms worldwide. Kenney et al. (2021) show that online platforms are present in 70 percent of service sectors in the US, representing 5.2 million establishments affected directly or indirectly and Ozalp et al. (2022) suggest that rising demand for online services through the Covid-19 pandemic has accelerated the expansion of platforms into highly regulated sectors such as healthcare and education.

As platforms have become pervasive, so has their power to reorganize, disperse, and recompose work (Kenney and Zysman, 2016). In doing so, platforms challenge conventional notions about what we term “work”, who is a worker, and how we measure and count

---

<sup>3</sup> The regulatory difficulties that the two Chinese giants, Alibaba and Tencent, faced at the end of 2021 resulted in their dropping out of the top ten global firms in terms of valuation. Recently, Facebook's various troubles resulted in it also dropping out of the top ten most valuable firms.

workers. Labor law in advanced countries normally assumes an employment relationship with some degree of permanence in which management hires workers, pays them for their time, and controls the work process or, at a minimum, there is a service contract with an organization (Stone, 2006; Weil, 2014; Williamson, 1996). The traditional relationship is codified by a contract that has obligations and responsibilities for both sides including workers' access to employment rights such as social insurance, occupational health and safety protection, antidiscrimination legislation, holiday, family and medical leave, and collective bargaining rights. On the peripheries of the labor market there are non-standard employment arrangements (independent contractors, temporary and on-call workers, and part-time workers) that have limited or no access to basic labor or collective bargaining rights (Kalleberg, 2018; Shevchuk et al. 2019). This fissured labor market is seen as an aberration that can be remedied by legal or government action.

In contrast, in platform-organized workplaces, outside the direct employees and contractors to platforms firms, those creating virtual goods and offering their services over a platform are not formally employed by the platform firm under the legislation of most countries (Moore and Joyce, 2019, De Stefano et al. 2021a). *Ipsa facto*, in the eyes of most legal systems, the platform does not provide “jobs”, what it provides is a virtual location over which the various sides of the platform can transact, and thus independent creators or sellers of goods or services can generate income from their clients (Kuhn and Maleki, 2017; Berg, 2016). Thus, a term such as “employment”, is not meaningful. But even the looser term “job” that still connotes something relatively permanent is too concrete, as the ability to earn income over that platform is at the platform’s will. Thus, it is ephemeral and difficult to understand as a job. And yet, those earning income over a platform must treat it as a job, by, for example, posting or selling regularly. Otherwise, their audience will disappear, and their algorithmic-generated ranking will decline -- a feature that creates pervasive tension and

stress (Kellogg et al. 2020). The word “labor” when it means “the expenditure of physical or mental effort” is adequate, but it often is associated with wages, which income earned through the platform is not. Similarly, one meaning of the word “work” has the implication of wages or salary, which again is an inaccurate description of the income generated over a platform. To capture the unique nature of income generation through providing value across a platform, we term activities that are mediated by the platform as “platform work” or “platform labor”. In the rest of the document, we will use these terms indistinctly to separate work monetized over a platform from work and labor in traditional settings. We will also refer to the actors that perform platform work as “platform workers”.

### *2.1 The Narrow Perspective and its Limitations*

Most studies of platform work are based on what we term the narrow perspective, which focuses on a remarkably small subset of platforms that offer a combination of services that are compensated over the platform such as Amazon Mechanical Turk (AMT), Deliveroo, Lyft, Uber, and Upwork (de Groen et al. 2021; ILO, 2021; Kenney et al. 2021; Kilhoffer et al. 2020; Timko and van Melik, 2021; Urzi Brancati et al. 2020; Wood et al. 2019). These platforms operate in only a few areas of economic activity. For instance, the EU’s COLLEEM survey examines 52 platforms, 40 of which correspond to three categories of services rendered in person: personal transportation services, delivery services, and domestic work (de Groen et al. 2021).

Studies based on such a narrow set of platforms have resulted in equally narrow taxonomies of platform work. For example, the ILO (2021) distinguishes between workers who are employed directly by a platform on a full time-time, part-time, or fixed-term basis (internal employment), and those whose engagement and work are mediated through web-based and location-based platforms (external employment). The OECD (2016) defines two

categories of platform work in service markets: services delivered physically (e.g., Airbnb or Uber) versus digitally (e.g., Upwork or AMT). Analyses based on the EU's COLLEEM survey (Pesole et al. 2018) and Urzi Bracanti et al. (2020), follow a similar distinction between activities that are carried out online and offline or on-location, as do De Stefano (2016) and Howcroft, and Bergvall-Kareborn (2019). Bogliacino et al. (2020), add a third criteria, the level of control of the platform over the worker. By contrast, Kalleberg and Dunn (2016) focus instead on the type of platform that workers are associated with, rather than the location of the work, and identify four types of platforms: crowdwork, online freelance, delivery/home tasks, and transportation. Along similar lines, Kuhn and Maleki (2017) develop a framework to classify platform workers based on two factors: workers' autonomy, and their dependence on the firm. Finally, Abraham et al. (2019) avoid the development of a taxonomy by presenting platform work as a type of non-employee work. Specifically, they define "gig employment" as "one-off jobs on which workers are paid for a particular task or for a defined period of time" (p 13).

These narrow classifications exclude large sectors of activity in which platforms have become or are becoming pervasive. To illustrate, the ETUI rules out the largest categories of platform income generation – influencers (YouTube, Instagram, Tiktok), app creators (Apple App Store and Google Play), online rentals (Airbnb), and product sales online (Amazon Marketplace, Etsy, etc.) (Piasna et al. 2022) -- without any doubt, more income is earned through these platforms than in the labor platforms receiving so much attention. Even when they include influencers and vendors, narrow taxonomies still exclude the vast population of workers whose activities have been transformed by platforms. These range from finance and real estate to car sales, healthcare, and beyond (Catlin et al. 2018; Kempton and Ahern, 2021; Grygiel and Lysak, 2021; Ozalp et al. 2022). In addition, narrow taxonomies exclude indirect platform work and work affected by platforms. Indirect platform work includes professionals

such as lawyers, script writers, marketing specialists, and multimedia artists that assist platform content creators (Bearson et al. 2021). By work affected by platforms we refer to the reorganization of entire legacy industries as a result of the rise of platforms (van Dijck et al. 2018; Hassel and Sieker, 2022). One such example is the advertising industry, where social media, online search engines, streaming media platforms, online stores, and online gaming platforms have transformed traditional media buying/planning activities beyond recognition (Australian Competition & Consumer Commission, 2021) and placed advertising industry incumbents in positions of dependence on the platform owners and their control over consumers.

These limitations have important implications: By excluding enormous areas of platform-based economic activities, classifications based on the narrow perspective underestimate the impact of platforms on work. The focus on a small subset of platforms underscores effects upon certain types of work while discounting other effects, skewing conclusions and underestimating the impact and scale of the problems that policy-makers face. Thus, the most important limitation is qualitative: by fixating on a limited set of platforms and effects, the narrow perspective fails to see the platform economy as a transformational force reverberating across all types of economic activities and most types of work.

There have been insightful contributions alerting us to a wider perspective on online value creation that we discuss here. Unfortunately, these general observations often fail to consider their impact upon work. For instance, Terranova's 2000 path-breaking work identifies "Free Labor" as a type of value-creation activity that integrates far larger number of individuals including open-source coders, content creators in the cultural industries, and even the online actions of consumers. She highlights the importance of user-generated content in general, rather than only through platforms. Further, she does not (perhaps because at that

time this category of platform work did not yet exist) distinguish between actors who create virtual goods and services to monetize them, such as influencers, those who create content purposefully but without an expectation of monetary compensation, such as Facebook users, and those who create content incidentally through activities such as liking, clicking, and browsing.

Building upon the earlier work on platform cooperatives by Trebor Scholz (2016), scholars such as Casilli and Posada (2018) distinguish between public and private sector platforms and non-profit cooperatives but do not elaborate on the impact of this distinction on workers. Similarly, Srnicek (2017), distinguishes between advertising, product, lean, industrial and cloud platforms based on their business model, but he does not discuss the impact of these different types of platforms on labor. More recently, Koutsimpogiorgos et al. (2020) identify four dimensions along which the platform economy differs from the rest of the economy: online vs. offline intermediation, independent contractors vs. employees, paid vs. unpaid activities, and services vs. providers of goods, but they do not connect these dimensions to different types of platform work. Their study understands the platform economy as distinguishable from “the rest of the economy,” and, of course, significant portions are, but we maintain that the power of the platform economy is that it is having a pervasive impact and thus is transforming the work content in legacy industries.

## *2.2. Introducing the Broad and Systemic Perspectives*

To define the broad and systemic perspectives our starting point is the work of Bearson et al. (2021). However, our taxonomy further clarifies and distinguishes among some of the categories they developed by adding four additional types of work not previously considered, and groups all the identified types of platform work into three broad categories

depending on whether the work is performed for the platform firm, through the platform or is affected by the platform. This will provide greater analytical clarity.

Following Bearson et al. (2021), we start by identifying three types of actors in the platform economy: platform firms, platform-dependent providers, and prosumers. Each of these actors is the site of multiple distinct types of labor that differ in terms of type of economic relationship to the platform, the types of actors involved, compensation, work conditions, and the process of value creation (Bearson et al. 2021). The term prosumer is a composite of the words *produce* and *consume*. Prosumers are platform users whose activities as they *consume* platform services *produce* the “raw material” data that platforms extract value from by selling the insights from it to advertisers, or, more directly, through commission from third-party sales or subscriptions (Ritzer and Jurgenson, 2010; Lang et al. 2020).

We then group these distinct types of work into three broad categories. The first is work for the platform firm, which refers to direct employment by the platform. Within this category we distinguish between white-collar employees, fulfillment employees, and contractors. White-collar employees of platform firms are expected to work long hours, but their compensation is excellent and their workplaces, often termed “campuses”, are lavishly equipped and offer many perks. In this respect, these workers are the aristocracy of the labor force, and their activities are governed by traditional labor relations. For some platforms, and in particular, Amazon, an entirely different work process and management structure exists in their fulfillment operations, where the work is regimented and subjected to brutal algorithmically monitored conditions (Delfanti, 2022). Finally, contractors are engaged directly by the platform firm or through a labor contracting firm to perform all manner of work. These are traditional contingent workers and are strictly managed to ensure they cannot

claim to be direct employees. They are often faced with most boring or grueling work such as content moderation (see, e.g., Gillespie 2018).

The second category is work mediated by the platform, which is what we defined earlier as platform work. This category can be separated into: 1) virtual and in-person service providers whose work is contracted and remunerated through the platform (the narrow perspective outlined above); 2) platform vendors who offer conventional goods and services through the platform; 3) content creators such as influencers and gamers which generate new virtual goods, content, or services to be posted on a platform and, if successful, receive compensation either through advertisement, subscription and/or patronage; and 4) prosumers. In the sense described above, everyone who interacts with an online platform is a prosumer.

The third category is work affected by the platform, which refers to work in existing industries that a platform enters and is able to reorganize so as to become the intermediary between one or more sides (Parker et al. 2016). This includes four separate groups: 1) professional services such as advertising and journalism; 2) indirect platform workers such as lawyers, actors, musicians, scriptwriters and web designers who perform tasks or render services, remotely or in person to support the activities of platform workers; 3) other services such as real estate and restaurants; and, tentatively, 4) manufacturing sectors, although much remains to be explored as to which sectors and to what extent they are being transformed by platforms (Wood, 2021).

We use this categorization, to define the narrow, broad and systemic perspectives on work impacted by the platform. To reiterate, the narrow perspective includes a limited set of activities over large, salient platforms that are carried out remotely or in-person. It reflects the existing literature, which, as we discussed, has important limitations. The broad perspective includes, in addition to the narrow perspective, the activities of platform vendors and content

creators because they are also platform dependent and, though they conform more closely to our idea of entrepreneurs, they are also in precarious and asymmetric relationship to the platform (Cutolo and Kenney, 2021). The broad perspective covers a much larger set of activities, thus overcoming the limitations of the narrow perspective while still enabling us to draw general conclusions. Finally, our systemic perspective shows the introduction of platforms into an ever larger and more diverse set of sectors and suggests that platforms are becoming one of the key societal infrastructures (Plantin et al. 2018).

Measuring the size of the different categories of work included in our three perspectives goes beyond the scope of this paper and will require a massive and ongoing dedicated research effort. Instead, we direct our attention to the very broad set of policy issues they raise, which range from topics such as lack of diversity and sexual harassment for white-collar direct employees (Hicks, 2018; Hodgson and Kuchler, 2018; Au-Yeung, 2021; Koblin and Sperling, 2021), to personal privacy and data protection issues for all users (Bourreau et al. 2020; Caffarra and Valletti, 2020; Scott Morton et al. 2019), behavioral manipulation (Forbrukerrådet, 2018; Gawer, 2021a; Lanier, 2018; Marsden and Podszun, 2020; Zuboff, 2015; 2019a, 2019b), and even new methods of general platform-enabled workforce monitoring (Scott and Orlikowski, 2012). Some of these issues cut across different categories of platform work, while others affect specific categories of workers more directly (e.g., auto salespersons, Barley 2015). To delimit the discussion, we adopt the broad perspective. The rationale is that while there may be differences of degree, the four categories included in the broad perspective raise a common set policy issues that are linked to the intrinsic features of platforms as new institutional forms and cover a broad range of value creating activities mediated by platforms while still concentrating on relatively well-defined groups of workers and activities. The following section uses that perspective to discuss the impact of platforms on four key aspects of work.

**(Figure 1 about here)**

### **3. Effects of Platforms on Work**

The technological and organizational dimensions of online platforms challenge existing work processes and outcomes (Shapiro, 2018). However, we are only starting to understand their many ramifications for policy, partly because few countries have adopted legislative responses specific to platform work (although the number of initiatives is growing). Many platforms operate across borders, but labor law is determined at the national level and there are important cross-country differences (Spasova et al. 2019) that affect policy preferences and policy procedures (Sieker, 2021; Prassl and Risak, 2017). Of course, other platforms such as ride-sharing are very local. In many cases, gig work also, particularly those that have cultural or country-specific characteristics may be national and thus more easily regulated (van Slageren et al. 2022).

Taking our broad perspective, this section explores the existing research in four overarching spheres that are central to work arrangements in advanced economies, cut across different categories of workers in these groups and are being directly challenged by online platforms: management power, labor protection and rights, work processes, and skill demand and career prospects. Our focus is on the relationship between the platform and workers rather than that between platform workers and those individuals or firms that request their services through the platform. This enables us to exclude issues such as the degree of competition on labor markets (Dube et al. 2018). In what follows, we explain how the literature has explored tensions between the existing understanding of each of these spheres and platform work and identify potential lines for further inquiry.

### *3.1 Management Power*

Online platforms define themselves as technology firms that facilitate transactions between independent workers and clients rather than employers that exert managerial control over their employees (Kuhn and Maleki, 2017; Berg, 2016).<sup>4</sup> These claims overlook the fact that the relationship between platforms and platform workers (and clients for that matter) is based on an extreme asymmetry of power and information (Berg and Johnston, 2019; Curchod et al. 2020). This arrangement is used by platforms to avoid responsibilities associated with conventional employment relationships. Power asymmetry derives from the platform firm's control over the technical architecture of the platform, the contract to which parties using the platform agree, and its ability to attract and retain users by lowering transaction costs for both sides (Cutolo and Kenney, 2021). Given that the value is created by the sellers and buyers, the platform's role is to perform the match-making function and consummate the transaction. In this situation, its overarching goal is to attract and retain the various participants because it “taxes” the value transacted over it (Pfeiffer, 2022). Platform power also stems from platform firm's ability to influence participant behavior and take advantage of network effects, or the ability to attract increasing numbers of users to both sides of the platform and long-tail effects, or the capacity to offer even the most obscure items to very diverse users (Cusumano et al. 2019; Parker et al. 2016).

Platform firms use a variety of mechanisms to exercise their power to assign tasks, surveil, and discipline users (Kellogg et al. 2020; Mateescu and Nguyen, 2019, Fabo et al. 2017). For instance, Uber uses surge pricing, requiring blind passenger acceptance, account deactivation for canceling unprofitable fares, a non-transparent rating and payment systems,

---

<sup>44</sup> There is some disagreement here as some practitioners consider firm such as Uber, Airbnb, etc. as “technology-enabled” firms, as they are not developing new technologies but rather applying existing ones in novel ways.

GPS tracking, institutionalized nudging, and decentralized, automated support systems to assign tasks and discipline drivers (Rosenblat and Stark, 2016). Veen et al.'s (2020) analysis of Deliveroo and UberEats highlights platform's selective provision of information to limit workers' choice, the obscure nature of performance evaluation systems, and the platforms' panoptic perspective.<sup>5</sup> Ivanova et al. (2018) discuss the use of notifications, monetary incentives, internal competition for work shifts and information-withholding to exercise power. Fabo et al. (2017) point out that some platforms charge commission fees, although these may be imposed on either the worker or on its counterpart. These mechanisms can make it difficult to determine whether the relationship between the platform or the worker fulfils the requirements of an employment relationship De Stefano et al. (2021b).

However, determination is not straightforward due to differences in the business models and mechanisms used by each platform, changes in these mechanisms over time, and variations in the legal definition of an employee across jurisdictions. In other words, governments can make the decision of whether someone working across a platform is an employee -- and, if it decides that, for example, a driver for Uber is employee *ipso facto*, Uber will no longer be a platform. The impact of these mechanisms on platform workers varies depending on the characteristics of the worker. Those for whom the platform is the main source of income, or who have made a significant capital or reputational investment to work over a particular platform are more dependent on the platform, and therefore more exposed to the consequences of platform power (Kuhn and Maleki, 2017; Lehdonvirta, 2018; Schor et al. 2020). Similarly, the more commoditized the work and the less skilled the platform worker the higher their exposure since these factors make platform workers

---

<sup>5</sup> We also do not discuss the fact that the algorithms are so opaque that there are documented instances where the platform "stole" the tips that were given to the platform delivery worker (Roose, 2019). This is only one example of the opacity that faces platform workers whose compensation is calculated by the platform's algorithms.

substitutable (Choudary 2018). Small platform vendors that lack brick and mortar facilities are also very vulnerable to platform power mechanisms (Churchod et al. 2020) because they often lack access to the resources and capabilities necessary to develop protective strategies such as multihoming and gaming (Cutolo and Kenney, 2021). Successful small vendors are also particularly exposed because platforms may use their position to enter markets built by the vendors and compete directly with them (Zhu and Liu, 2018; Wen and Zhu, 2019).

### *3.2 Work Processes*

Although highly related, we distinguish between the broader implications of power asymmetry discussed above, and the specific impact of algorithmic systems on management practices, working conditions, and human resources functions, in line with the distinctive, and extensive treatment this has received in the literature. “Algorithmic management” or the use of mathematical formulas on various data collected to manage relationships with platform workers (Lee et al. 2015) has triggered changes in management practices, primarily in terms of direction, discipline, monitoring, and control (Wood, 2021). According to Kellogg et al. (2020), algorithms afford six mechanisms to exert these functions: 1) restricting information or access to people or resources; 2) recommending, or influencing behavior, usually through tools such as nudges and surge pricing; 3) recording finely-grained data about a wide range of worker behavior, including beyond working hours, to provide real-time feedback; 4) rating, or gathering user- and peer-generated feedback and using predictive statistics to forecast workers’ future performance; 5) replacing, or even automatically deplatforming underperforming workers; and 6) rewarding or using algorithms to recompense workers with opportunities, higher pay and promotions, penalize them, or gamify the work experience. Algorithms’ comprehensiveness, instantaneity, interactivity, and opacity make such mechanisms qualitatively different and more intrusive than traditional forms of management control. The control and visibility that the platform owner has also allows it to not only

closely monitor the actions of the workers but also enroll customers and others in the disciplining process.

Algorithmic management has important implications for working conditions. While algorithms provide the platform a degree of control over workers, the absence of human supervisors and flexibility in deciding when, where, and how to work, simultaneously grants workers more autonomy leading to what Mazmanian et al. (2013) call the “autonomy paradox”. Accordingly, some authors find that algorithmic management has a host of negative effects for workers including isolation (Vallas, 2019; Vallas and Kovalainen, 2019), precarity, anxiety, and insecurity (Kalleberg, 2009; Schneider and Harknett, 2019; Cirillo et al. 2021), low pay, social isolation, unsocial, irregular work schedules, overwork, sleep deprivation and exhaustion (Wood et al. 2019), unfairness (Lee et al. 2015), high levels of work intensity and work–home spill-over (Felstead and Henseke, 2017) and discrimination (Rosenblat et al. 2017; Silva and Kenney, 2019). However, these coexist with positive effects such as worker’s perceptions of higher levels of control over their place of work (Berg, 2016; D’Cruz and Noronha, 2016), flexibility, task variety, and complexity (Wood et al. 2019), autonomy (Shapiro, 2018), or even the “fun of meeting and having conversations with new people” (Lee et al. 2015).

Platforms are also transforming human resource management, or “ecosystem” management, as is referred to in the context of platform workers (Meijerink and Keegan, 2019). Particular areas are worker recruitment, motivation, performance evaluation, and dispute resolution. The technological architecture of platforms transforms recruitment in at least four ways. Platforms that provide services remotely can recruit from a larger, global pool of candidates (Wood et al. 2019; Kellogg et al. 2020). The onboarding process is simplified: anyone wishing to work or sell on a platform only needs to create an account and be approved to begin offering their services. Algorithms accelerate recruitment (Valentine et

al. 2017; Salehi et al. 2017) via online skills and personality assessments (Ajunwa and Greene, 2019) or by helping employers identify ideal candidates (Kellogg et al. 2020). Finally, some platforms help decrease information asymmetries. Platforms such as Glassdoor.com or Kununu.com enable individuals to post information about their employers and workplace, while workers and employers can use platforms such as LinkedIn to find new opportunities or to gauge whether a specific employee may be searching for a new job (Schaarschmidt et al. 2021; Carpentier and Van Hoye, 2020, Carpentier et al. 2019).

Algorithms may have a negative effect on workers' motivation and performance (Lee et al. 2015; Tomprou and Lee, 2022). Difficulty understanding the rationale behind algorithmic decisions fosters feelings of alienation and loss of control (Graham et al. 2017; Shapiro, 2018) that result in lack of trust and motivation, lower productivity, and high levels of worker turnover (Bergvall Kareborn and Howcroft, 2014; Howcroft and Bergvall Kareborn, 2019; Lee et al. 2015; Rosenblat and Stark, 2016; Shapiro, 2018; Tomprou and Lee, 2022). Platforms, especially those that require higher skills levels, counter these effects by providing an environment that supports worker autonomy, flexibility, specialization, and autonomy (Jabagi et al. 2019). Platforms also use compensation and various other features to gamify the work process in an effort to extract greater compliance and value from the workers (Scheiber, 2017; Vasudevan and Chan, 2022). In addition, platforms that only require basic skills may compensate by engaging new contingents of workers rapidly and by exercising pervasive types of control (Kuhn and Maleki, 2017), despite the fact that such a business model can result in a vicious circle of high attrition and distrust.

Platforms turn performance evaluation on its head. Whereas managers in legacy work settings appraise workers' performance periodically through subjective, human evaluations, platforms aggregate quantitative and qualitative feedback from internal and external resources to provide feedback in real-time (Kellogg et al. 2020). Platforms collect a constant

stream of finely grained data about worker behavior. In-person service platforms such as Uber use geolocation positioning to match drivers and customers, collect data on canceled trips, and assess driver quality (Rosenblat and Stark, 2016). Platforms that provide virtual services such as AMT and Upwork, use keystroke loggers and random worker screenshots to ensure that the platform worker is doing the task, and other technical means to assess speed and productivity and to monitor the work process (Wood et al. 2019). In addition to internal data, nearly all platforms utilize online reviews and rating systems to assess workers' performance. These are often anonymous, which means that the rankings are based upon opinions, subjective experiences, and any other criteria deemed important to the ranker (Cameron and Rahman, 2022; Maffie, 2022; Orlikowski and Scott, 2014). While management has always tried to enlist consumers in monitoring workers, this is dramatically simplified and costless on platforms.

The enrollment of consumers in managerial functions and the reliance on opaque algorithms means that there is often no pre-established procedure to challenge either a rating or any algorithmic decisions derived because of the rating (Wexler, 2018) and less opportunities to appeal for exceptions based on human empathy (Lee et al. 2015). Because consumer ratings are made by independent parties, the platform claims to have no responsibility regarding accuracy or fairness, thereby relieving management of any legal liability such as that would accrue if the worker were an employee being rated by management. Yet, since the ranking are anonymous, the platforms control both the data and the algorithms that calculate the result, and workers have access to either, the platform firm could manipulate the results for self-serving purposes.

### *3.3 Social Protection and Labor Rights*

Since under most legislations the platform does not purchase the labor time of platform workers, it has no obligations toward them beyond what is contractually agreed upon (De Groen et al. 2021). This enables platforms to avoid the responsibilities for social protection, taxes, and administrative costs that come with employment (Cappelli and Keller, 2013), creating what is commonly referred to as the “social protection gap”. It is important to reiterate that platform workers contract with the purchaser of their services, not with the platform. For instance, in the case of content creators, the viewer “contracts” with the platform for the right to watch and the creator contracts with the platform for the right to upload videos that, if watched sufficiently, will be monetized through advertisements and other sources of income. The relationship of the platform to the worker is, under most jurisdictions, not that of an employer but also not that of a buyer. The closest analogy to the physical world is that a platform, such as YouTube or TikTok, takes the videos through a relationship that resembles that of a store accepting items on a consignment basis. What YouTube or Tiktok sells is “view time” to advertisers or, more recently, a monthly access fee for viewers. All parties to a transaction made across a platform are undertaking the transaction “at will” (Behrendt and Nguyen, 2019).

Although there is a broad awareness of this feature (Forde et al. 2017; Gawer and Srnicek, 2020; Huws, 2017; Joyce et al. 2019; Prassl and Risak, 2017; Sieker, 2021), the literature on social protection for platform work is still in its infancy. Part of the problem is that because the literature tends to adopt the narrow perspective, most contributions provide a general overview of the problems, but usually these are limited to one of our categories of platform work. Therefore, few conceptualize the full range of impacts upon work, and there is little comparative research into the motivations and the political underpinnings of different policy approaches or their effects. This section reflects such limitations.

Some authors (De Stefano, 2016; Joyce et al. 2019), rightfully see platform work as a manifestation of broader trends toward the casualization of work and the demutualization of risks. Joyce et al. (2019) draw on this assessment to argue that issues related to the social protection gap among platform workers are best addressed through measures that tackle problems of insecure work more broadly, although they fail to make specific suggestions. Moreover, for in-person platform work, governments, which are spatially based, can mandate policies that ameliorate the situation of the workers (van Slageren et al. 2022). For remote work, which often crosses national boundaries, this is more difficult. For content creators, such as YouTubers, vloggers, etc., mandating various social protections may be even more difficult, as the line between “professional” creators and amateur influencers is almost impossible to draw.

Among those who see platform work as an area that requires targeted policy responses, Prassl and Risak (2017) suggest four complementary approaches: 1) redefining the concept of an employer based on the actual functions that platforms exercise; 2) redefining the concept of an employee based on the level of economic dependency of the worker; 3) creating an intermediary category between employee and self-employed; or 4) equating platform work to existing regulations applied to three-party employment relationships such as temporary agency work. The first two options underline the fact that definitions of workers and employers differ across jurisdictions, making it difficult to generalize (Forde et al. 2017). Critics of the third option highlight the fact that intermediate categories differ across jurisdictions, creating grey zones that could increase arbitrage and litigation (De Stefano, 2016).

Sieker (2021) proposes integrating platform work into existing industrial relations systems and reclassifying platform workers as employees. He expects legal systems that already provide high levels of protection to non-permanent workers to opt for the first and

those on the opposite end of the spectrum to prefer the second. The proposed EU Directive on Improving Working Conditions in Platform Work puts forward a framework to address the “misclassification” of platform workers based on the principle of the primacy of facts and the contestable presumption that there exists an employment relationship, validating the second of these approaches. Yet, applying these rules to platform vendors, creators, and other virtual service providers will be difficult. As an alternative, Cutolo and Kenney (2021) suggest that governments could alter some of the contractual provisions often known as platform “terms and conditions” in ways that would redress the power imbalance between the platform and the workers. Examples of such interventions could include framing rules and community principles in a clear, specific way, to limit the breadth of platform interpretation, or preventing platforms from applying new terms and conditions retroactively.

Broad variation in recent legislation reflects the broad diversity of possible approaches: several state level initiatives in the US explicitly already exclude the existence of an employment relationship between platforms and workers, while others such as Spain’s Ryders’ Law, extend the presumption of an employment relationship. Proposals or recent legislation in other countries fall somewhere in between (De Stefano et al. 2021a). Additional research is needed to explore the institutional factors and power relationships behind national approaches and their implications for platforms and workers.

### *3.3 Skills demands and career prospects*

Few studies have looked at the impact of platforms on skills, which suggests there are significant opportunities here for future research. Available research has adopted a limited version of the narrow perspective focused only on virtual services such as AMT and Upwork (CEDEFOP, 2020, 2021). Such narrow perspective is particularly constraining because skills vary dramatically across different types of platform work. For instance, Upwork workers

have complex cognitive (formal) skills in areas such as foreign languages and translation, legal advice, or software (CEDEFOP, 2020), but Uber drivers require little more than a driver's license and a certain level of digital literacy (Rosenblat and Stark, 2016), and content creators rely strongly on non-cognitive skills that are not acquired through formal training (Wagner, 2014), such communication, persuasion, learning to learn, adaptability, agility, creativity, curiosity, and imagination.

These differences affect the frequency, costs, and pathways of skill development (CEDEFOP, 2020). Complex cognitive skills such as software development, take time to develop, usually through formal, structured educational programs, require significant analytical capacity, and evolve quickly requiring a constant investment in updates. Less complex cognitive skills such as driving or conducting simple, routine tasks necessitate much less prior formal training or regular updating, and non-cognitive skills are often learnt through experience (FEDEFOP, 2021).

Despite these differences, there are four common factors that affect skill development for platform work. First, unlike conventional employers, platforms do not assume responsibility for workers' learning and skill development (Margaryan, 2019). Fleming (2017) argues that individualized training practices may lead to lower skills levels and lack of worker autonomy across the workforces of advanced economies. However, empirical analyses show that platform workers actively pursue skill development (CEDEFOP, 2020, 2021). Nonetheless, platform workers prioritize just-in-time skill development, usually through informal learning resources such as online communities, feedback from clients, or YouTube videos rather than longer, formal educational programs associated with the development of overarching skills, such as critical thinking (FEDEFOP, 2020). The effect of these practices is still uncertain because platform workers tend to have some form of tertiary

education (ILO, 2021; de Groen et al. 2021), or to be pursuing a university degree while engaged in platform work (Wood et al. 2019).

It is worth noting that although platforms do not assume responsibility for skill development, they provide signals to workers as to the types of skills that are in higher demand. For instance, Upwork publishes periodical lists of top skills on their website. Platforms also offer certification programs and help connect experienced workers with others who seek to develop their skills (FEDEFOP, 2021). These certifications do not necessarily contribute to cognitive skill development, but they help workers without established reputations validate their competences (Kässi and Lehdonvirta, 2019).

The second factor is the substitution of human managers for algorithms. The absence of formal, human appraisal procedures, the opacity of algorithmic rating weights (Kellogg, 2020; Rosenblat and Stark, 2016; Shapiro, 2018), and the volatility and contradictions inherent to customer ratings (Orlikowski and Scott, 2014) mean that whereas platforms gather a stream of live data about platform workers, such data does not necessarily translate into actionable information for skill development. Instead, workers are forced to develop their own strategic career goals, identify skills gaps, create plans to develop them, and evaluate their achievements (Zimmerman and Kitsantas, 2005). This by itself requires non-cognitive skills, such as self-reflection, strategic planning, and self-management, that are inherently hard to develop. As platform work continues to expand, understanding workers' ability to develop long-term career enhancing strategies such as these will be critical in assessing the quality of platform work.

The third factor is skill portability. As workers seek to operate across platforms or move up toward more specialized types of work, including offline work, the ability of workers to detach their skills, experience and reputations from the individual platforms for

which they work becomes important. FEDEFOP (2020) identifies four main barriers to skills portability: 1) platforms' lack of incentives; 2) the absence of broadly accepted skills standards; 3) technical challenges that would require data sharing across platforms, and 4) ambiguity in existing data protection regulation. Research into the types of skills that might be useful for platform workers will be necessary prior to the introduction of policies aimed at skill development.

In respect to platform-organized markets, skills are sectoral and formal training does not necessarily provide significant advantage. For some genres of platform work, skills and their portability take on entirely new meanings. For a ride sharing driver, skill portability may be reduced to learning how to manage and game the algorithms. In other cases, significant skills may be developed. For example, successful content creators and platform vendors may manage multiple platforms and entire staffs of contractors or even employees.

The fourth factor is transiency. In conventional work settings, skill formation is conceptualized as a function of formal training or, at least, apprenticeships through which a set of skills that match a fairly stable market are created. However, because the platform itself is constantly endeavoring to absorb more of the entire value in the transaction it intermediates, any skills may be transient or must constantly evolve as the platform changes its algorithms. To illustrate, a key skill for YouTubers is channeling viewers to off-platform monetization opportunities -- this is clearly not traditional skill formation (Hua et al. 2022). Uber pursued autonomous vehicles in the hopes of disintermediating drivers. Similarly, initially Amazon vendors did their own fulfillment. However, when Amazon introduced its fulfillment services, it also discouraged Marketplace sellers from self-fulfillment by changing the ranking algorithm to favor Fulfillment by Amazon (Zhu and Liu, 2018). Thus, the skills developed by sellers were devalued. In such dynamic environments, the most general skill of an ability to adapt to changes may be of greatest importance.

Career formation for platform work varies markedly depending on the type of work performed. However, it should be stipulated, beyond the benefits of longevity as a possible incentive to the buyer, platforms provide little additional compensation to long time drivers, vendors, influencers etc. In ridesharing, to speak of a career is almost meaningless. However, operating a short-term rental business that includes ownership of the properties creates a “career” as a property owner/manager. In the first case, there is no advantage to seniority or learning. In the second case, there would be learning about how to manage one’s assets. For content creators and platform vendors, career formation is possible in the sense that success can create a viable, long-lasting businesses -- though all of these businesses remain precarious and at the will of the platform.

#### **4. Discussion, Conclusions, and Future Avenues for Research**

The rise and maturation of the platform economy has enabled new forms of work, reorganized existing work, and changed the activities and objects of work. Little wonder that assessment of the impact of platforms is open to redefinition. However, when thinking about work and value creation in platform-mediated environments, much of the literature and policymaking has focused on the narrow perspective, namely in-person and remote service provision, as they have captured the interest of academics and policy makers. We extended the narrow perspective by including vendors and creators, because they are also platform dependent and find themselves in precarious and asymmetric relationship to the platform. In addition, our systemic perspective shows the introduction of platforms into ever more social and economic activity and suggests platforms are becoming a key institutional form that affects labor in complex and often in sectoral-specific ways. Further, and, quite importantly, many of the platforms are changing and new platform services are being introduced; both of which change the nature and opportunities for work.

The increasing intermediation of platforms poses multiple challenges for policy makers and scholars. The first is reformulating the concepts of what we call work, who is a worker, and how we measure and count workers when platforms treat them as independent businesses. We are not suggesting that traditional employment will disappear, as the platform firms themselves have regular employees. But if one accepts that platforms are a new institutional form through which what Pfeiffer (2022) terms “distribution” operates and that this is likely irreversible, the categories or “mental models” of employment and jobs derived from the past, no longer describe the arrangements by which an increasing number of people generate income.

The debate about concepts and categories matters. A clear categorization will enable policy makers and scholars to develop ways to quantify the impact of the platform economy more accurately, a necessary first step to understand its impact. In addition, categories matter because different rules apply to each category--employees, contractors and gig workers, independent entrepreneurs and have important implications for labor and social policies, and tax and administrative purposes. Our analysis of the literature suggests that policy makers may adopt variety of options ranging from expanding the definitions of employers and employees, to explicitly excluding platform work from conventional employment relations, to creating an intermediary category between employment and entrepreneurship. Countries have started to introduce new legislation or reinterpret existing norms in line with these different options, but additional research is needed to understand the motivations, power structures, and institutional matrices behind policy maker’s choices and their implications for platform workers, firms, and the economy.

Platforms affect power relationships, work processes, levels of social protection and demand for skills in complex, interrelated ways. While these are specialized areas, policymakers should not conclude that these are independent and unrelated but rather as

multiple prongs within a holistic policy response to the rise and maturity of platforms and their impact on an increasing range of value creation areas.

While research into some of these areas is still in its infancy, our conceptual analysis suggest that policy makers should consider policies that counter the dramatic asymmetries of power between platform and workers and prevent exploitation. In particular, policymakers may want to consider measures that reduce the potential for algorithmic management to exacerbate self-exploitation in terms of working hours and conditions, driving the work pace in an environment of mass surveillance that realizes Bentham's vision of a panopticon. As platform-mediated sales and content creation continue to grow, competition and regulatory decisions about the legality of certain terms and conditions in contracts between the platform and its users can also have significant implications on the conditions under which complementors work and earn income.

In addition, policy makers may want to recast social protection programs to ensure that platform work does not exacerbate existing levels of social inequality and creates new forms of “e-precariat”. Such processes are likely to be highly contentious. Path dependencies, entrenched interests, and power relationships across public and private stakeholders make social protection systems notoriously difficult to reform. Furthermore, while policies are determined at the national level, several categories of platform work can be performed across borders, creating new challenges and potential tensions across jurisdictions.

Platform work also calls for countries to redefine existing educational and skills programs to ensure that workers are equipped with an appropriate combination of cognitive and non-cognitive skills. Our analysis suggests that skills systems should emphasize non-cognitive skills such as such as self-reflection, strategic planning, and self-management, which are not currently included in the curricula of most advanced countries. Furthermore,

individual countries or groups of countries could consider the adoption of common skill standards to decrease workers' dependence on individual platforms. In addition, policymakers may entertain the development of a broad-range of flexible, online micro-skills programs to enable workers to update their skillsets flexibly and rapidly in line with fast-paced changes in labor demand. As in the case of national systems of labor protection, cross-national variations in existing institutions and national political economies will likely make these processes highly idiosyncratic.

Our critical review also reveals several areas that could benefit from additional research. One of them is quantifying the impact of the platform economy on work. As pointed in the introduction, lack of homogeneous criteria and different national institutional environments have made it difficult to develop suitable metrics that can be used to compare across countries making it difficult to measure the impact of the platform economy. Our framework, with its characterization of different types of work and their classification in three different broad groups can provide a starting point for these efforts.

In addition, as countries continue to introduce legislation that redefines the concept of work, additional research will be needed to understand the institutional and power structures behind the diversity of national approaches and to assess the implications of different institutional approaches for labor, for firms, and for our understanding of the evolution of different forms of capitalism.

Finally, our analysis of the four spheres in which platforms affect existing work arrangements, calls for political economists and policy scholars to gauge the types of measures that may be most effective in addressing power imbalances between platforms and workers, prevent platforms from greatly increasing levels of social inequality, and ensuring

that workers have the skills necessary to compete for platform work, and to develop satisfactory careers.

As this critical review has shown, the continuing subsumption of work as an activity and labor as a process, into a world structured around platforms is a vital topic for scholars interested in contemporary capitalism.

## Bibliography

Abraham, K.G., Haltiwanger, J.C., Sandusky, K., and Spletzer, J.R. 2019. Measuring the gig economy: Current knowledge and open issues. Working Paper 24950

<http://www.nber.org/papers/w24950>

Ajunwa, I. and Greene, D. 2019. Platforms at work: Automated hiring platforms and other new intermediaries in the organization of work. In *Work and Labor in the Digital Age*: 61–91. Bingley, UK: Emerald Publishing Limited.

Au-Eyung, A. 2021. Technology employees warn: Companies should expect more uprisings in 2022. *Forbes*. Published, December 29, 2021. Accessed February 14, 2022.

<https://www.forbes.com/sites/angelauyeung/2021/12/29/technology-employees-warn-companies-should-expect-more-uprisings-in-2022/?sh=2177d2537154>

Australian Competition & Consumer Commission, 2021. Digital Advertising Services Inquiry: Final Report. (August). <https://www.accc.gov.au/focus-areas/inquiries-ongoing/digital-advertising-services-inquiry/interim-report>.

Barley, S. R. 2015. Why the internet makes buying a car less loathsome: How technologies change role relations. *Academy of Management Discoveries*, 1(1), 5-35.

Bearson, D., Kenney, M., and Zysman, J. 2021. Measuring the impacts of labor in the platform economy: new work created, old work reorganized, and value creation reconfigured. *Industrial and Corporate Change*, 30(3), 536–563.

Behrendt, C., and Nguyen, Q. A. 2019. Ensuring universal social protection for the future of work. *Transfer*, 25(2), 205–219.

Berg J. 2016. Income security in the on-demand economy: findings and policy lessons from a survey of crowdworkers. *Comparative Labor Law & Policy Journal* 37(3): 543–576

Berg, J., and Johnston, H. 2019. Too good to be true? A comment on Hall and Krueger's analysis of the labor market for Uber's driver-partners. *Industrial and Labor Relations Review*, 72(1), 39-68.

Bogliacino, F., Codagnone, C., Cirillo, V., & Guarascio, D. 2020. Quantity and quality of work in the platform economy. In *Handbook of Labor, Human Resources and Population Economics* (pp. 1-28). Cham: Springer International Publishing.

Bourreau, M., Caffarra, Chen, Z., Choe, C., C., Crawford, G., Duso, T., Genakos, C., Heudues, P., Peitz, M., Rønde, T., Schnitzer, M., Schutz, N., Sovinsky, M., Spagnolo, G., Toivanen, O., Valletti, T., and Vergé, T. 2020. Google/Fitbit will monetise health data and harm consumers. *CEPR Policy Insights* No. 107.

<https://euagenda.eu/upload/publications/policyinsight107.pdf.pdf>.

Caffarra, C. and Valletti, T. 2020. Google/Fitbit review: Privacy IS a competition issue. *Vox EU/CEPR*. 4 March. <https://voxeu.org/content/googlefitbit-review-privacy-competition-issue>.

Cameron, L. D., and Rahman, H. 2022. Expanding the locus of resistance: Understanding the co-constitution of control and resistance in the gig economy. *Organization Science*, 33(1), 38-58.

Cappelli, P., and Keller, J. R. 2013. Classifying work in the new economy. *Academy of Management Review*, 38, 575–596.

Carpentier, M., and Van Hoye, G. 2020. Managing organizational attractiveness after a negative employer review: Company response strategies and review consensus. *European Journal of Work and Organizational Psychology*, 30(2), 274-291.

Carpentier, M., Van Hoye, G., & Weijters, B. (2019). Attracting applicants through the organization's social media page: Signaling employer brand personality. *Journal of Vocational Behavior*, 115, 103326.

Casilli, A., and Posada, J. 2018. The platformization of labor and society. In M. Graham & W. H. Dutton (eds.), *Society and the Internet; How Networks of Information and Communication Are Changing Our Lives*, Oxford, UK: Oxford University Press.

Catlin, T., Lorenz, J. T., Nandan, J., Sharma, S., & Waschto, A. 2018. Insurance beyond digital: The rise of ecosystems and platforms. *McKinsey & Company*.

CEDEFOP, 2021. Skill development in the platform economy. Comparing microwork and online freelancing. Luxembourg: Publications Office of the European Union. Cedefop research paper; No 81

CEDEFOP. 2020. Developing and matching skills in the online platform economy Findings on new forms of digital work and learning from Cedefop's CrowdLearn study. Cedefop reference series 116 Luxembourg: Publications Office of the European Union, 2020.

Cenamor, J. and Frishammar, J. 2021. Openness in platform ecosystems: Innovation strategies for complementary products. *Research Policy* 50(1-2) 104148.

Choudary, S.P. 2018. The architecture of digital labor platforms: Policy recommendations on platform design for worker well-being. *ILO Research Paper* 3. Geneva, Switzerland.

Cirillo, V., Guarascio, D., & Parolin, Z. 2021. Platform work and economic insecurity: Evidence from Italian survey data (No. 2021/13). *LEM Working Paper Series*.

<https://www.econstor.eu/handle/10419/243509>

Curchod, C., Patriotta, G., Cohen, L., & Neysen, N. 2020. Working for an algorithm: Power asymmetries and agency in online work settings. *Administrative Science Quarterly*, 65(3), 644-676.

Cusumano, M. A., Gawer, A., & Yoffie, D. B. 2019. *The Business of Platforms*. New York: Harper Business.

Cutolo, D. and Kenney, M. 2021. Platform-dependent entrepreneurs: Power asymmetries, risks, and strategies in the Platform Economy. *Academy of Management Perspectives*. 35(4) <https://doi.org/10.5465/amp.2019.0103>

D'Cruz, P. and Noronha, E. 2016. Positives outweighing negatives: the experiences of Indian crowdsourced workers. *Work Organisation, Labour & Globalisation* 10 (1) 44–63.

Delfanti, A. 2022. *The Warehouse. Workers and Robots at Amazon*. London: Pluto Press.

De Groen, W.P. ,Kilhoffer, Z., Westhoff, L., Postica, D., and Shamsfakhr, F. 2021. Digital labour platforms in the EU. Mapping and business models. prepared by CEPS for the European Commission, Directorate-General for Employment, Social Affairs and Inclusion (DG EMPL). Brussels: European Commission.

De Stefano, V. 2016. The rise of the “Just-in-time workforce: On-demand work, crowdwork, and labor protection in the “gig-economy.” *Comparative Labor Law and Policy Journal*. 37 (3) 471-504

De Stefano, V., Durri, I., Stylogiannis, C., & Wouters, M. 2021a. Platform work and the employment (No. 995121493302676). International Labour Organization

De Stefano, V., and Wouters, M. 2021b. *Embedding platforms in contemporary labour law. A Modern Guide to Labour and the Platform Economy*. Edward Elgar Publishing, 2021. 129-144.

Dube, A., Jacobs, J., Naidu, S., and Suri, S. 2018. Monopsony in Online Labor Markets. NBER Working Paper Series. Working Paper 24416. Cambridge, MA.

Fabo, B., Beblavy, M., Kilhoffer, Z. and Lenaerst, K. 2017. Overview of European Platforms: Scope and Business Models, Luxembourg, Publications Office of the European Union.

Felstead, A. and Henseke, G. 2017. Assessing the growth of remote working and its consequences for effort, well-being and work-life balance. *New Technology, Work and Employment* 32(3)195–212.

Fleming, P. 2017. The human capital hoax: Work, debt and insecurity in the era of Uberization. *Organization Studies* 38(5) 691–709.

Forbrukerrådet. 2018. Deceived by design. How tech companies use dark patterns to discourage us from exercising our rights to privacy. Oslo. <https://fil.forbrukerradet.no/wp-content/uploads/2018/06/2018-06-27-deceived-by-design-final.pdf>.

Forde, C. Stuart, M., Joyce, S., Oliver, L., Valizade, D., Alberti, G., Hardy, K., Trappmann, V. Charles Umney, Carson, C. 2017. The Social Protection of Workers in the Platform Economy. European Parliament. Directorate-General for Internal Policies. [https://www.europarl.europa.eu/RegData/etudes/STUD/2017/614184/IPOL\\_STU\(2017\)614184\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2017/614184/IPOL_STU(2017)614184_EN.pdf)

Frenken, K., Vaskelainen, T., Fünfschilling, L., & Piscicelli, L. 2020. An institutional logics perspective on the gig economy. In *Theorizing the sharing economy: Variety and trajectories of new forms of organizing*. Emerald Publishing Limited.

Gawer, A. 2021a. Digital platforms' boundaries: The interplay of firm scope, platform sides, and digital interfaces. *Long Range Planning* 54(5) 102045.

Gawer, A. 2021b. Digital platforms and ecosystems: remarks on the dominant organizational forms of the digital age. *Innovation: Organization and Management* 24(1) 110-124.

Gawer, A. 2014. 'Bridging differing perspectives on technological platforms: toward an integrative framework,' *Research Policy*, 43(7) 1239–1249.

Gillespie, T. 2018. *Custodians of the Internet. Platforms, content moderation, and the hidden decisions that shape social media.* New Haven: Yale University Press.

Graham, M., Hjorth, I., and Lehdonvirta, V. 2017. Digital labour and development: Impacts of global digital labour platforms and the gig economy on worker livelihoods. *Transfer: European Review of Labour and Research*, 23(2): 135–162.

Grygiel, J. and Lysak, S. 2021. Police Social Media and Broadcast News: An Investigation into the Impact of Police Use of Facebook on Journalists' Gatekeeping Role, *Journalism Practice*, 15:7, 994-1011, DOI: 10.1080/17512786.2020.17591

Hassel, A. and Sieker, F. 2022. How Amazon changed work in logistics in the United States, Germany and the United Kingdom. *European Journal of Industrial Relations*. 0 (0) 1-20.

Hicks, M. 2018. The long story behind the Google walkout. *Verge*. (November 9), Accessed February 14, 2022. <https://www.theverge.com/2018/11/9/18078664/google-walkout-history-tech-strikes-labor-organizing>

Hodgson, C. and Kuchler, H. 2018. Google employees across the world stage walkouts. *Financial Times*. Published November 1, 2018, accessed February 14, 2022. <https://www.ft.com/content/7f70c53c-ddcd-11e8-8f50-cbae5495d92b>

Howcroft, D. and Bergvall-Kareborn, B. 2019. 'A typology of crowdwork platforms,' *Work, Employment and Society*, 33(1), 21–38.

Hua, Y., Ribeiro, M. H., West, R., Ristenpart, T., & Naaman, M. 2022. Characterizing alternative monetization strategies on YouTube. arXiv preprint arXiv:2203.10143.

Huws, U. 2017. Where did online platforms come from? The virtualization of work organization and the new policy challenges it raises. In, Meil, P. and Kirov, V. 2017. Policy implications of virtual work. E-book. Palgrave Macmillan.

International Labor Organization. 2021. World Employment and Social Outlook. The Role of Digital Labor Platforms in Transforming the World of Work. Geneva: International Labor Organization.

Ivanova, M., Bronowicka, J., Kocher, E., and Degner, A. 2018. The App as a Boss? Control and Autonomy in Application-Based Management. *Arbeit | Grenze | Fluss - Work in Progress interdisziplinärer Arbeitsforschung* Nr. 2, Frankfurt (Oder): Viadrina, doi:10.11584/Arbeit-Grenze

Jabagi, N., Croteau, A.-M. Audebrand, L.K., Marsan, J. 2019. Gig-workers' motivation: thinking beyond carrots and sticks. *Journal of Managerial Psychology*. 34(4), 192-213

Jacobides, M. G., Cennamo, C., and Gawer, A. 2018. 'Towards a theory of ecosystems,' *Strategic Management Journal*, 39(8), 2255–2276.

Joyce, S., Stuart, M., Forde, C., and Valizade, D. 2020. Work and social protection in the platform economy in Europe. *Advances in Industrial and Labor Relations*. 25: 153-184.

Kässi, O. and Lehdonvirta, V. 2019. Do Digital Skill Certificates Help New Workers Enter the Market? Evidence from an Online Labour Platform. CESIFO Working Papers. 7810, August, 2019.

Kalleberg, A. L. 2018. *Precarious Lives: Job Insecurity and Well-Being in Rich Democracies*. Cambridge: Polity Press.

Kalleberg, A. L. and Dunn, M. 2016, 'Good jobs, bad jobs in the gig economy,' *Perspectives on Work*, accessed at <http://lerachapters.org/OJS/ojs-2.4.4-1/index.php/PFL/article/viewFile/3112/3087> on February, 8, 2022.

Kalleberg, A. L. 2009. Precarious work, insecure workers: Employment relations in transition. *American Sociological Review* 74(1), 1–22.

Kellogg, K.C., Valentine, M. and Christin, A. 2020. Algorithms at work: The new contested terrain of control. *Academy of Management Annals* 14(1): 366–410.

Kempton, S.D., Connolly Ahern, C. 2021. Mastering metrics: The impact of social media on the routines and values of broadcast journalists. *Electronic News*, 15(3-4):109-122.  
doi:10.1177/19312431211050050

Kenney, M., Bearson, D. and Zysman, J. 2021. The platform economy matures: measuring pervasiveness and exploring power. *Socio-Economic Review*, 2021, Vol. 00, No. 0, 1–33

Kenney, M. and Zysman, J. 2016. The rise of the Platform Economy. *Issues in Science and Technology* 32 (3): 61-69.

Kilhoffer, Z., de Groen, W.P., Lenaerts, K. Smits, I., Hauben, H., Waeyaert, W., Giacumacatos, E., Jean- Lhernould, P., Robin-Olivier, S. 2020. Study to gather evidence on the working conditions of platform workers. Brussels: European Commission.

Koblin, J. and Sperling, N. 2021. Netflix employees walk out to protest Dave Chappelle's special. *New York Times*. (October 25), accessed February 14, 2022.

<https://www.nytimes.com/2021/10/20/business/media/netflix-protest-dave-chappelle.html>

Koutsogiorgos, N., Van Slageren, J., Herrmann, A.M., and Frenken, K. 2020. Conceptualizing the Gig Economy and Its Regulatory Problems. *Policy and Internet* 12 (1): 525-545.

Kuhn, K. M., and Maleki, A. 2017. Micro-entrepreneurs, dependent contractors, and instaserfs: Understanding online labor platform workforces. *Academy of Management Perspectives*, 31(3), 183-200.

Kretschmer, T., Leiponen, A., Schilling, M., & Vasudeva, G. 2022. Platform ecosystems as meta-organizations: Implications for platform strategies. *Strategic Management Journal*, 43(3), 405-424.

Lang, B., Dolan, R., Kemper, J., & Northey, G. 2020. Prosumers in times of crisis: definition, archetypes and implications. *Journal of Service Management*, 32 (2) 179-189.

Lanier, J. 2018. Ten arguments for deleting your social media accounts right now. Random House.

Lehdonvirta. V. 2018. Flexibility in the gig economy: managing time on three online piecework platforms. *New Technology, Work and Employment* 33 (1) 13-29.

Maffie, M. D. 2022. The perils of laundering control through customers: A study of control and resistance in the ride-hail industry. *Industrial and Labor Relations Review*, 75(2) 348-372.

Margaryan, A. 2020. Comparing crowdworkers' and conventional knowledge workers self-regulated learning strategies in the workplace. *Human Computation*. 6 (1): 83-97.

Marsden, P., and Podszun, R. 2020. Restoring balance to digital competition – Sensible rules, effective enforcement. Konrad Adenauer Stiftung. <https://www.kas.de/en/single-title/-/content/restoring-balance-to-digital-competition-sensible-rules-effective-enforcement>.

Mateescu, A. and Nguyen, A. 2019. Explainer Algorithmic Management in the Workplace. New York: Data & Society.

Mazmanian, M., Orlikowski, W. J., & Yates, J. 2013. The autonomy paradox: The implications of mobile email devices for knowledge professionals. *Organization Science*, 24(5), 1337-1357.

Meijerink, J. and Keegan, A. 2019. Conceptualizing human resource management in the gig economy: Toward a platform ecosystem perspective. *Journal of Managerial Psychology*. 34 (4) 214-232.

Neff, G. 2012. *Venture Labor: Work and the Burden of Risk in Innovative Industries*. Cambridge: MIT Press.

OECD. 2016. 'New forms of work in the digital economy,' OECD Digital Economy Papers, No. 260, OECD Publishing: Paris, France

Orlikowski, W. J. and Scott, S.V. 2014. Exploring Apparatuses of Valuation in the Travel Sector. *Organization Science* 25(3): 868–891.

Ozalp, H., Ozcan, P., Dinckel, D., Zachariadis, M., & Gawer, A. (2022). "Digital colonization" of highly regulated industries: An analysis of big tech platforms' entry into health care and education. *California Management Review*, 1-30.

Parker, G. G., Van Alstyne, M. W., and Choudary, S. P. 2016. *Platform revolution: How networked markets are transforming the economy and how to make them work for you*. New York: WW Norton & Company.

Pesole, A., Urzì Brancati, M. C., Fernandez-Macias, E., Biagi, F., and Gonzalez Vazquez, I. 2018, 'Platform workers in Europe,' JRC Science for Policy Report, European Commission: Brussels.

Petit, N. and Teece, D. J. 2021. Innovating Big Tech firms and competition policy: favoring dynamic over static competition. *Industrial and Corporate Change*. 30(5), 1168–1198.

Pfeiffer, S. 2022. Digital Capitalism and Distributive Forces. Bielefeld: Transcript Verlag: Bielefeld, Germany.

Piasna, A., Zwysen, W., and Drahokoupil, J. 2022. The platform economy in Europe: Results from the second ETUI Internet and Platform Work Survey. European Trade Union Institute Working Paper 2022-5.

Plantin, J. C., Lagoze, C., Edwards, P. N., & Sandvig, C. 2018. Infrastructure studies meet platform studies in the age of Google and Facebook. *New Media & Society*, 20(1), 293-310.

Powell, W.W. 1990. Neither Market nor Hierarchy: Network Forms of Organization. *Research in Organizational Behavior*. 12, 295-336.

Prassl, J. and Risak, M. 2017. The legal protection of crowdworkers: Four avenues for worker's rights in the virtual realm. In Meil, P. and Kirov, V. 2017. Policy implications of virtual work. E-book. Palgrave McMillan.

Ritzer, G. and Jurgenson, N. 2010. Production, consumption, prosumption: the nature of capitalism in the age of the digital 'prosumer.' *Journal of Consumer Culture*, 10(1) 13–36.

Roose, K. 2019. After uproar, Instacart backs off controversial tipping policy. *New York Times* (February 6) <https://www.nytimes.com/2019/02/06/technology/instacart-doordash-tipping-deliveries.html>

Rosenblat, A., E.C. Levy, K. E. C., Barocas, S., and Hwang, T. 2017. Discriminating Tastes: Uber's Customer Ratings as Vehicles for Workplace Discrimination: Customer Ratings and Workplace Discrimination. *Policy and Internet* 9 (3) 256-279.

Rosenblat, A. and Stark, L. 2016. Algorithmic Labor and Information Asymmetries: A Case Study of Uber's Drivers. *International Journal of Communication* 10, 3758–3784.

Salehi, N., McCabe, A., Valentine, M., & Bernstein, M. 2017. Huddler: Convening stable and familiar crowd teams despite unpredictable availability. Paper presented at the Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing.

Schaarschmidt, M., Walsh, G. and Ivens, S. 2021. Digital war for talent: How profile reputations on company rating platforms drive job seekers' application intentions. *Journal of Vocational Behavior*. 131 103644.

Scheiber, N. 2017. How Uber uses psychological tricks to push its drivers' buttons. *New York Times* published April 2, 2017. Accessed July 2, 2022.

<https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html>

Scholz, T. 2016. Platform Cooperativism. Challenging the Corporate Sharing Economy. New York, NY: Rosa Luxemburg Foundation.

Schor, J.B., Attwood-Charles, W., Cansoy, M., Ladegaard, I., and Wengronowitz, R. 2020. Dependence and precarity in the platform economy. *Theory and Society* 49, 833–861.

Schneider, D. and Harknett, K. 2019. Consequences of routine work schedule instability for worker health and well-being. *American Sociological Review* 84(1) 82–114

Scott Morton, F., Bouvier, P., Ezrachi, A., Jullien, B., Katz, R., Kimmelman, G., Melamed, D., and Morgenstern, J. 2019. 'The Stigler Report'. Committee for the Study of Digital Platforms, Market Structure and Antitrust Subcommittee, Stigler Center for the Study of the Economy and the State. <https://www.publicknowledge.org/wp-content/uploads/2019/09/Stigler-Committee-on-Digital-Platforms-Final-report.pdf/>.

Scott, S. V. and. Orlikowski, W. J. 2012, 'Reconfiguring relations of accountability: materialization of social media in the travel sector,' *Accounting, Organizations and Society*, 37(1), 26–40.

Silva, S., and Kenney, M. 2019. Algorithms, platforms, and ethnic bias. *Communications of the ACM*, 62(11), 37-39.

Shevchuk, A., Strebkov, D., & Davis, S. N. 2019. The autonomy paradox: How night work undermines subjective well-being of internet-based freelancers. *ILR Review*, 72(1), 75-100.

Sieker, F. 2021. Platform work and access to social protection across major European countries. *Hertie School of Governance*.

Spasova, S., Bouget, D., Ghailani, D., and Vanherchke, B. 2019. Self-employment and social protection: Understanding variations between welfare regimes. *Journal of Poverty and Social Justice*, 27(2) 157-175

Srnicek, N. 2020. Paths Forward for the Study of the Digital Economy. In James Muldoon, Will Stronge, eds. *Platforming Equality: Policy Challenges for the Digital Economy*. London: Autonomy.

Srnicek, N. 2017. *Platform Capitalism*. John Wiley & Sons: Hoboken, NJ.

Stone, K. V. 2006. Legal protections for atypical employees: Employment law for workers without workplaces and employees without employers. *Berkeley Journal of Employment and Labor Law*, 27, 251–286

Terranova, T. 2000. Free Labor: Producing Culture for the Digital Economy. *Social Text*, 63:18, 2, 33-58.

Tomprou, M. and Lee, M.K. 2022. Employment relationships in algorithmic management: A psychological contract perspective. *Computers in Human Behavior* 126 106997.

Urzi Brancati, M.C., Pesole, A., Fernández-Macías, E. 2020. New evidence on platform workers in Europe. Results from the second COLLEEM survey. European Commission, JRC Science for Policy Report. Luxembourg: Publications Office of the European Union.

Valentine, M. A., Retelny, D., To, A., Rahmati, N., Doshi, T., and Bernstein, M. S. 2017. Flash organizations: Crowdsourcing complex work by structuring crowds as organizations. Paper presented at the Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems.

Vallas, S. P. 2019. Platform capitalism: What's at stake for workers? *New Labor Forum*, 28 (1) 48–59.

Vallas, S. P., and Kovalainen, A. 2019. *Taking stock of the digital revolution, work and labor in the digital age:1–12*. Bingley, UK: Emerald Publishing Limited.

Van Dijck, J., Poell, T., and de Waal, M. 2018. *The Platform Society*. London: Oxford University Press.

van Slageren, J., Herrmann, A. M., & Frenken, K. 2022. Is the online gig economy beyond national reach? A European analysis. *Socio-Economic Review*.

<https://doi.org/10.1093/ser/mwac038>

Vasudevan, K. and Chan, N. K. 2022. Gamification and work games: Examining consent and resistance among Uber drivers. *New Media & Society*, 24 (4) 866-886.

Veen, A., Barratt, T., and Caleb Goods, C. 2020. Platform-Capital's 'App-etite' for Control: A Labour Process Analysis of Food-Delivery Work in Australia. *Work, Employment and Society* 34(3) 388–406.

Wagner, T. 2014. *The global achievement gap: why even our best schools don't teach the new survival skills our children need-and what we can do about it*. UK: Basic

Books/Hachette. <https://www.basicbooks.com/titles/tonywagner/the-global-achievement-gap/9780465055968/>

Weil, D. 2014. *The Fissured Workplace*. Harvard University Press: Cambridge, MA.

Wen, W., and Zhu, F. 2019. Threat of platform-owner entry and complementor responses: Evidence from the mobile app market. *Strategic Management Journal*, 40(9) 1336-1367.

Wexler, R. 2018. The Odds of Justice: Code of Silence: How private companies hide flaws in the software that governments use to decide who goes to prison and who gets out, *Chance*, 31(3) 67-72.

Williamson, O. E. 1996. *The Mechanisms of Governance*. Oxford: Oxford University Press.

Williamson, O. E. 1975. *Markets and Hierarchies*, New York: Free Press.

Wood, A.J. 2021. Algorithmic Management Consequences for Work Organisation and Working Conditions. *JRC Working Papers Series on Labour, Education and Technology* 2021/07.

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. 2019. Good gig, bad gig: autonomy and algorithmic control in the global gig economy. *Work, Employment and Society*, 33(1) 56-75.

Zhu, F., and Liu, Q. 2018. Competing with complementors: An empirical look at Amazon.com. *Strategic Management Journal*, 39(10), 2618-2642.

Zimmerman, B.J.; Kitsantas, A. 2005. The hidden dimension of personal competence: self-regulated learning and practice. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of Competence and Motivation* (pp. 509–526). New York: Guilford Publications.

Zuboff, S. 2015. Big other: Surveillance capitalism and the prospects of an information civilization. *Journal of Information Technology*, 30, 75-89.

Zuboff, S. 2019a. *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. London: Profile Books.

Zuboff, S. 2019b. Surveillance Capitalism and the challenge of collective action. *New Labor Forum* 28(1): 10–29.