DIGITALIZATION AND THE WORLD OF WORK: IMPLICATIONS FOR INTERNATIONAL LABOR STANDARDS

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ABSTRACT
Digital transformations are reshaping the world of work and employment relationships. Lockdowns implemented as a response to the Covid-19 pandemic accelerated these transformations, further shifting patterns of work, consumption, and the provision of services. This study proposes a taxonomy of multiple channels through which emerging developments in digitalization are impacting work and redefining employment relationships globally. The patterns and shifts identified are assessed in relation to the "International Labour Organization Centenary Declaration for the Future of Work" adopted by employers, labor unions, and government representatives in 2019. The taxonomy highlights the gaps in the current governance structures as they relate to digitalization. It also can inform the development of a comprehensive framework for governing the digital economy in a manner that is consistent with International Labour Standards, minimizes social risks, and harnesses the long-term benefits of digital tools.

KEYWORDS: *digitalization, International Labour Organization, labor market, taxonomy*

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1. INTRODUCTION

Digital tools are now ubiquitous in the world of work and are reshaping how companies operate and business is conducted. The increased adoption of technology is changing the nature of jobs, how tasks are organized, and employment relationships. The Covid-19 pandemic accelerated the implementation of digital tools. This can be seen through the shift to more remote working arrangements, increased online communications and coordination, and changes in how services are delivered and goods consumed. Circumstances related to the crises resulting from the pandemic allowed for more experimentation and improvisation, providing space to evaluate the results and decide which tools to continue to use in a post-crisis context (Pinzaru et al., 2020).
This study focuses on how emerging developments in digitalization are impacting people working for and interacting with the organizations adopting these changes. The International Labour Organization (ILO) sets forth in a tripartite manner — including the support and participation of governments, labor unions, and employers — standards and rights for the workplace. These rights are agreed upon with the recognition that social peace, mutual respect, morale, and safety of workers are essential to a stable business environment, innovation, and productivity growth (ILO, 2019). Based on these agreed-upon standards, we work towards developing a taxonomy of the intersection between digitalization and labor rights. This research complements existing literature and taxonomies that evaluate other aspects of digitalization or analyze a narrow channel in the

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relation to workers' rights. Our findings provide additional insights on the benefits and risks of adopting new digital tools and a perspective on the need to balance short-term savings with social responsibility and potential long-term costs.

2. DIGITALIZATION AND THE WORKPLACE

This section provides a snapshot of the literature on how digitalization is impacting the world of work including areas of concern, potential benefits, as well as some of the highly publicized expectations predating the pandemic regarding the use and adoption of technology.

2.1 Pace of the adoption of new technology and Covid-19

The consulting firm McKinsey & Company has been influential in shaping the conversations around the future of work, with a report from Manyika et al. (2017) garnering a lot of attention, mostly around its predictions around automation and the displacement of millions of workers. The mass automation and displacement predictions are countered by Mindell and Reynolds (2022) who highlight that the pace of the adoption of technologies in workplaces is much slower than often thought and that there is a need for increased investment and strengthening of labor market institutions to foster innovation and productivity gains. Cashman (2020) points out that the prospect of the adoption of new technology, but not the actual likelihood of adoption, provides employers with a tool to extract concessions from their employees. This may suggest that employers have the incentive to exaggerate when and how new technologies will be adopted.

The impact of Covid-19 on the pace of digitalization of work was analyzed by Amankwah-Amoah et al. (2021). They looked at the competing pressures in favor and against an acceleration in the adoption of digital tools. The authors created a unified framework of these competing forces, composed on one side of positive effects (such as improved efficiency and cost reduction) and on the other side, of risks (such as those involving increased surveillance, lower morale, and lower productivity). Faraj et al. (2021) show that rapid shifts and adoption of new digital tools during Covid-19 had mixed results on productivity. Their results highlight the limitations of digital technology and caution against optimistic predictions around adoption.

2.2 The quality and structure of employment

Research on the impact of digitalization on employment numbers highlights that, rather than the displacement of employees with robots, platform work specifically has replaced full-time jobs with a more precarious form of work conducted by what platforms often refer to as independent contractors (Gurumurthy et al., 2021). Gurumurthy et al. (2021) highlight that many of the workers classified as independent contractors by platforms perform work that is closely monitored and tightly regulated suggesting that these workers are likely misclassified in many jurisdictions to evade labor laws and norms. Online platforms have other effects as well. For example, they increase the ease of outsourcing and fragmentation of work through global value chains, and employers in both standard and non-standard arrangements are increasingly making use of digital tools for surveillance purposes, collecting data on how workers perform their jobs. Platforms also make it easier to collect data on specific activities of workers and enable new ways of evaluating workers based on this data.

2.3 Surveillance and algorithmic tracking

Surveillance practices are increasingly common with traditional employers as well (Gurumurthy et al., 2021). Research commissioned by worker representatives highlights this increased use of surveillance in the workplace. Surveillance tools identified include location tracking, random screen captures, measurement of the rate of typing or completion of other tasks, recording breaks, as well as arrival and departure times (Voss and Rego, 2019). The practice of so-called "algorithmic

disciplining" outsources much, if not all, of the decisions regarding the allocation of tasks, measurement of performance, rewards, and penalties to automated processes (Gurumurthy et al., 2021). Algorithms that power artificial intelligence (AI) tools are developed with the data collected through surveillance as tools to support various management decisions, including those regarding hiring, discipline, and resource and task allocation (Leslie, 2019). Often cited as neutral and as a tool to avoid human error in management decisions, Leslie (2019) finds that the use of algorithms and machine learning can further perpetuate biases and be discriminatory practices. According to Leslie (2019), algorithms often incorporate the biases and prejudices of those who develop them, or reinforce problems with the underlying data (for example, problems with where, from whom, and how data is collected).

2.4 On-location and remote work

Through extensive surveys that covered over 3,500 workers, Berg et al. (2018) studied the emergence of work mediated through digital platforms, the emergence of work organized through microtasks, and the impact therefrom, on working conditions and employment relationships. Berg et al. (2018) distinguish between on-location and remote forms of platform work, emphasizing the non-visibility of those performing microtasks remotely. They find these workers are typically not covered by labor laws and protections, earn lower wages than their on-location counterparts, and face a lack of transparency on how their work is evaluated.

2.5 Competition policy

Gawer (2016) identified the implications of digitalization on competition policy. They find risks of a trend toward the concentration of markets and a lack of a legal framework to address these risks, and identify negative implications that monopoly positions have for medium and small enterprises as well as workers. Currently, over 90 percent of the market capitalization of digital platforms was concentrated in China and the United States. In 2020, the market valuation of Apple was $2 trillion, larger than the entire GDPs of over 80 percent of countries (UNCTAD, 2021).

Horan (2017) makes a detailed argument involving the financials of the taxi company Uber that shows that the company has lost a considerable amount of venture capital in an attempt to expand its core businesses, but has not demonstrated profitability. The use of venture capital allowed Uber to subsidize its core business, undercutting smaller but profitable businesses. This allowed Uber to gain a considerable share of the taxi market, with digitalization as the main justification for the market's concentration. The distortion of the market by these unsustainable subsidies also can have negative effects on social goods and other markets (Cashman, 2016).

2.6 Governance and worker rights

Governance of digitalization has been mostly limited to the national level or below, although there are efforts to develop a globally coherent framework from the Organization for Cooperation and Development (OECD), the Group of 20 (G20), and various United Nations (UN) agencies. At the request of the G20, the OECD has produced a report documenting the challenges of defining, measuring, and governing processes around digitalization (OECD, 2020). The ILO, which is the international UN governance structure for setting labor standards, adopted a tripartite declaration on the Future of Work in 2019. The Declaration, endorsed by governments, workers, and employers, expressed the urgency of shaping a "fair, inclusive future of work with productive and freely chosen employment and decent work for all" (ILO, 2019). Companies with businesses involving digital tools are also using World Trade Organization (WTO) to negotiate new agreements on digital trade, which could have far-reaching impacts on the regulation of digital work in many countries (James, 2020).

Horan (2019) provides a useful case study involving Uber. He shows how Uber's digital tools and aggressive lobbying allowed the company to gain a foothold for its taxi business in many

jurisdictions where its practices were illegal. This dynamic, as well as patchwork of laws across various jurisdictions in the United States that apply to businesses that use digital tools, creates an environment that makes regulatory capture more likely. The result is that companies like Uber have significant power in establishing norms around work as it relates to their businesses, even though the use of digital tools did not fundamentally alter the employer–employee relationship and despite the existence of laws that should apply to their businesses.

Rhinehart et al. (2021) show the pervasive problem of misclassification in the United States, where employees are incorrectly classified by their employers as independent contractors, denying them basic rights. These rights include "wage and hour protections, anti-discrimination protections, workers' compensation, unemployment benefits, and the right to organize" among others. Businesses that use digital tools will often claim that their employees benefit from this misclassification, supposedly preferring the flexibility misclassification provides, but in reality, few of these employees have meaningful direction over their work. Zipperer et al. (2021) survey these workers and find they largely suffer from poor working conditions and low pay.

Ahsan (2018) uses a stakeholders' theory framework to examine the claims that workers are entrepreneurs and not employees and concludes that these claims are problematic and misleading. This, therefore, necessitates regulatory oversight. From an ethical perspective, Chai and Scully (2019) conclude that "when labor is controlled by platform owners and algorithms…workers may not fully enjoy the freedoms the sharing economy implies, even if their engagement across time and place becomes more free." They also posit that some digital business models might be incompatible with corporate social responsibility goals given that they rely on depriving workers of rights. However, Hielscher et al. (2022) envision that platforms could develop a "sharing constitution" in an institutional environment with the involvement of platforms, political actors, and civil society. In a similar but narrower example, Kim and Routledge (2022) explore the creation of a "right of explanation" for workers when they face algorithmic decision-making.

2.7 Existing taxonomies

We have identified several studies that have proposed classifications and taxonomies in the area of digitalization and work. Peña-Casas et al. (2019) assessed how public sector employees are impacted by the adoption of digital tools, including the impacts of reduced human interaction, increased isolation, and the challenges of developing digital tools for organizing tasks without the involvement of workers. Their study presents a conceptual framework of how digital tools affect job quality. A taxonomy of the digital intensity of various sectors of the economy based on investments in digital equipment and levels of automation is proposed by Caline et al. (2018), while Berger et al. (2018) propose a taxonomy of available digital technology and its adoption. Mrass and Peters (2018) produced a taxonomy of the types of digital tools. They identify online platforms and digital devices as the main categories of tools and provide an overview of how they are used to organize work, how they deliver products, and the degree of mobility they allow. Fernandez-Macias and Bisello (2022) looked at the interaction between skills and technology to assess the possible impacts on the labor market, developing a taxonomy of how tasks are performed and organized.

3. CONSTRUCTING A TAXONOMY

This section outlines the methodology for constructing a taxonomy and outlines the criteria it aims to meet to serve as a useful analysis tool.

We follow the methodology outlined by Nickerson et al. (2013) on the attributes of a useful taxonomy. We aim to develop a concise framework that:

1. contains just enough dimensions and characteristics to differentiate between the objects of interest;
2. is explanatory; and

3. can be extended if needed.

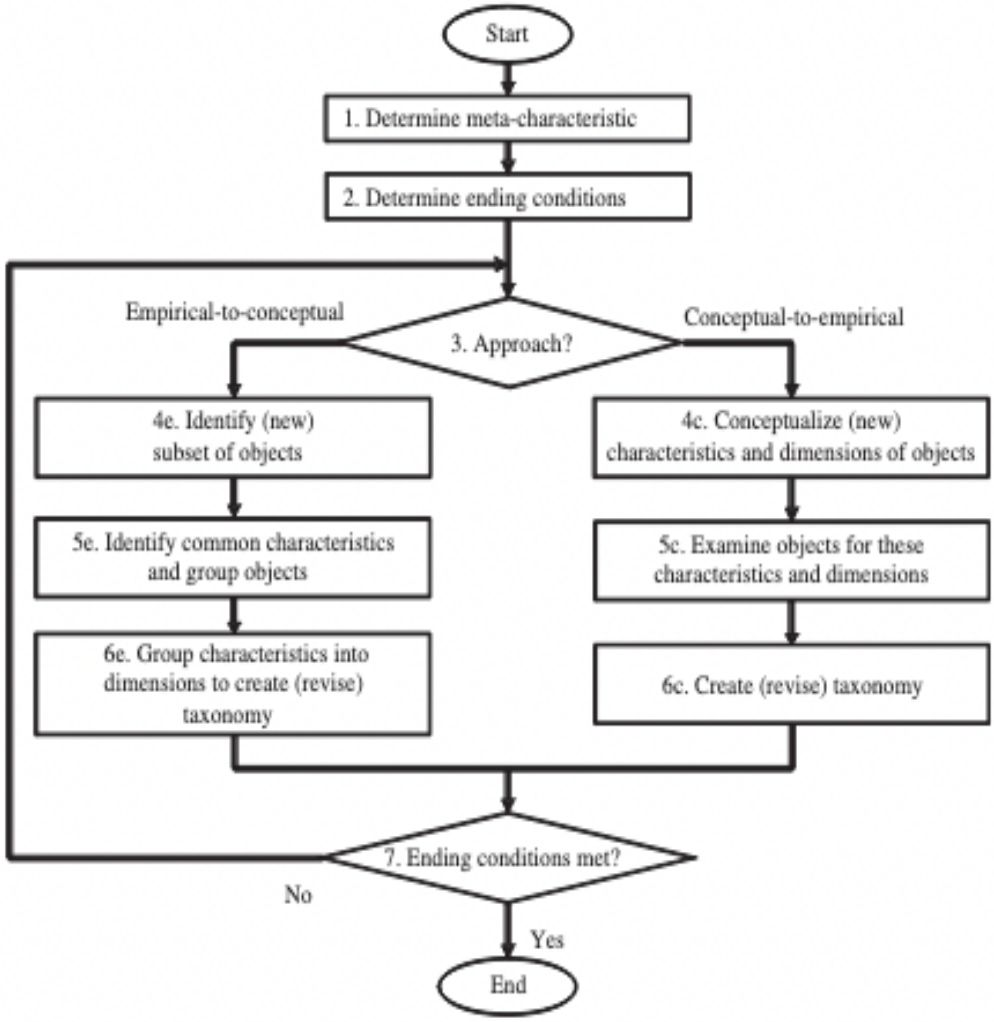

Figure 1. The taxonomy development method
Source: adapted from Nickerson et al. (2013)

Figure 1 depicts the processes used in identifying common characteristics and grouping items to create categories that allow for useful sorting and analysis.
We follow the outline proposed by De Hogg (1981) on structuring a taxonomy and start with the representation of the concepts, followed by the ordering and classification, and application. The remainder of this section establishes a benchmark for labor rights and defines some of the key concepts around digitalization and digital tools, as applied, for this study.

3.1 Benchmark for labor rights

Starting with the ILO Declaration on the Future of Work (2019) we compile a list of labor rights, adding elements referenced from the ILO Decent Work Agenda (2017) and the ILO Fundamental Rights at Work (1998) document. The resulting list of labor rights provides a basis for analysis of the impact of digitalization.

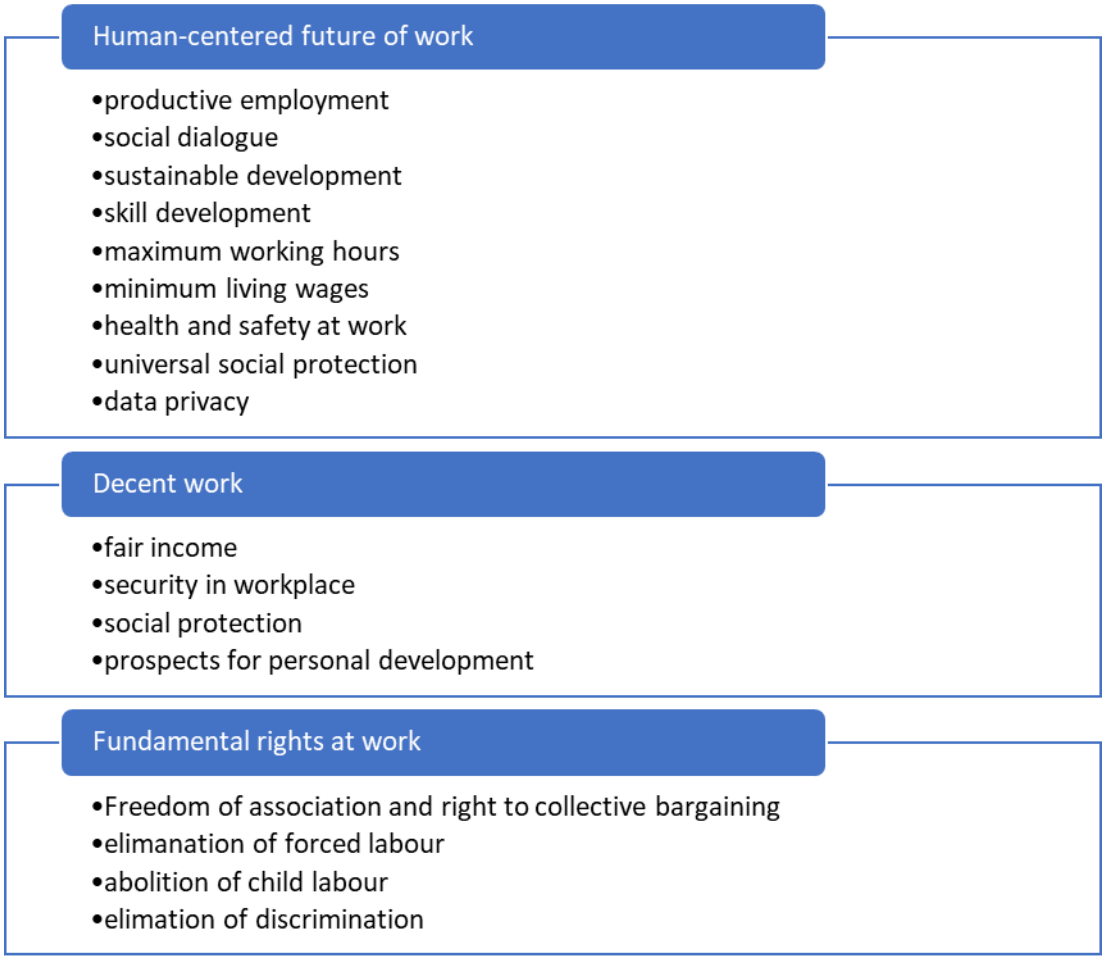

Figure 2. Labor rights

Source: authors' ellaboration from ILO (1998, 2017, 2019)

Figure 2 illustrates the list of rights and standards developed directly in response to digitalization, as well as the fundamental rights of workers and the standards used to align work with an agenda that is consistent with the UN Sustainable Goals Agenda.

3.2 Defining key concepts

There is no single comprehensive definition of the digital economy or digitalization, nor a standard way to measure what it encapsulates. For reference, we use the following definition from the OECD:

"Digital Economy incorporates all economic activity reliant on, or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, digital services and data. It refers to all producers and consumers, including government, that are utilising these digital inputs in their economic activities." (OECD, 2020)

In the context of this paper, we identify the following categories as emerging developments in digitalization and identify the shifts in available technologies, their applications, and trends in their adoption. These categories draw on OECD (2022) and the broader literature.

Table 1. Emerging developments in digitalization

Telecommunications and broadcasting	Cloud computing and big data	Automation, artificial intelligence (AI), and the internet of things
• growing number of households and businesses are connected to the internet, reaching about half the world's population	• infrastructure to remotely store, process, and access large amounts of data	• certain tasks and segments in manufacturing processes can be fully or partially automated
• widespread use of smartphones, tablets, and other devices connected to the internet	• on-demand availability of computer system resources without the need for individuals or companies to set up their own server infrastructure	• certain tasks performed by humans in a range of occupations can be automated
• development and adoption of faster and higher performing networks	• lowers barriers for cross-border data flows	• use of AI to evaluate outcomes or predict possible outcomes, and automate decision-making processes
• widespread proliferation of devices using satellite-based radionavigation systems, like Global Positioning System (GPS), and applications that enable precise location and movement tracking	• collecting and analyzing massive amounts of data from workers, consumers, operations of businesses, social media	• the internet of things enables real-time connection and coordination between digital devices
	• development and use of algorithms to evaluate large datasets, which provides a basis for machine learning and AI	• enable real-time tracking, analysis, and coordination of processes occurring in multiple locations anywhere in the world
		• expands the possibilities of deploying 3D printing in manufacturing processes and artificial reality in various applications

Source: authors' elaboration

Table 1 provides an overview of the main developments in digitalization that are at the basis of the shifts happening within the world of work.

3.3 Digitalization and workers' rights

This section presents preliminary results: a taxonomy of emerging developments in digitalization and their intersection with workers' rights.

Based on the trends identified in Section 3.2 we identify the following channels through which digital tools are incorporated within the world of work:

1. Traditional forms of employment adopting digital tools on the job;
2. Employment through a digital platform, providing services on-location or virtually; and

3. Use of digital tools by management for coordination, surveillance, and evaluation of workers. Through these channels, digital tools are reshaping parts of the world of work and intersecting with the rights of workers. We propose the following taxonomy to identify these interactions (Figure 3).

Figure 3. Taxonomy to identify the interaction between digital tools and workers' rights
Source: authors' elaboration

We implement this simple framework in what are emerging as areas of concern based on the trends highlighted in Section 3.2. The results are shown in Table 2.

Table 2. The intersection of digitalization and labor rights

Areas of concern	Uses of digital tools	Intersections with labor rights	Labor rights possibly infringed
Surveillance	• collection of data • increased ability to monitor digital activity and communications • increased video surveillance • tracking movements through GPS-type devices, including wearable devices	• interferes with the privacy of workers, including data privacy	• *Human-centered future of work*: social dialogue, health and safety at work, data privacy • *Decent work*: security in the workplace
Management by algorithms	• collection of data • development and deployment of algorithms as management tools to measure performance, discipline and reward workers, as well as to assign tasks • substitution of human decision-making	• lack of clarity and transparency • risk being assigned too much work or punishment for outside interferences with their tasks	• *Human-centered future of work*: social dialogue, health and safety at work, data privacy • *Decent work*: security in the workplace, social protection
Hiring	• job applications processed through third-party digital platforms	• algorithms can replicate biases • privacy concerns, data may be shared with third parties	• *Human-centered future of work*: data privacy • *Fundamental rights at work*: elimination of discrimination
Digitalization of tasks	• incorporating digital tools to complement worker-performed tasks • digital skills as a requirement for an increasing number of jobs • using digital tools and devices that share information and reduce the need for person-to-person interactions	• often does not qualify as decent work; lifelong training and skill development need to be provided	• *Human-centered future of work*: social dialogue, skill development • *Decent work*: security in the workplace

Areas of concern	Uses of digital tools	Intersections with labor rights	Labor rights possibly infringed
Platformization	• online platforms connect those providing a service, either on-location or remotely, to those seeking it • collection of data • management by algorithms, including for pricing and logistics which may impact consumers	• loss of labor protections and social insurance due to misclassification • often does not qualify as decent work • often does not allow for the freedom of association and the right to collective bargaining • introduces new types of discrimination, both for workers and consumers	• *Human-centered future of work*: productive employment, social dialogue, skill development, maximum working hours, minimum living wages, health and safety at work, universal social protection, data privacy • *Decent work*: fair income, security in the workplace, social protection, prospects for personal development • *Fundamental rights at work*: freedom of association and right to collective bargaining, elimination of discrimination
Outsourcing	• advancements in video conferencing software, cloud computing, and other online tools for collaboration that facilitate remote work and piecemeal work	• puts downwards pressure on wages, increases the risk of misclassification, and evades social responsibility as the employer	• *Human-centered future of work*: social dialogue, universal social protection, data privacy • *Decent work*: social protection

Source: authors' elaboration

4. CONCLUSIONS

Digital tools are reshaping the world of work and changing norms within employment relationships. The ILO has adopted a resolution on the positive vision for a human-centered future of work and the rights workers ought to have for this vision to be fulfilled. This study provides a preliminary framework for better understanding the relationship between digitalization, the changes it brings to the workplace, and the interactions with labor rights.

Areas of concern, visible to observers and workers themselves, should lead to deeper investigation in how digital tools are used in the workplace, informed by emerging research on those tools. By examining the likely effects of those tools and their intersection of labor rights, we can better understand how digital tools jeopardize labor rights as defined by successive ILO statements.

Our taxonomy has revealed that several areas of concerns touch fundamental worker rights in addition to those involving decent work and a human-center future of work. This suggests that digital tools - whatever benefits they might have - may represent threats to long-held conceptions of labor rights as well as newer conceptions. It is worth exploring this via one area of concern, platformization. This specific area will help us understand the taxonomy we have developed.

By this analysis, platformization appears to be the greatest threat to labor rights, touching all three categories and many specific rights. This is not altogether surprising: platformization as commonly implemented gives employers more direct control over markets and workers and can combine different areas of concern. For example, a platform can combine surveillance, the digitalization of tasks, and the management of algorithms.

Consider Uber. In contrast to street hailed or radio dispatched taxis of the past, Uber has real-time information about its employee-drivers and its users. It can choose how to connect the two together, and is free to set the terms of that engagement as well as how much the company charges either party. It can also reward or discipline either party based on data it has collected and analyzed; for example, it can deactivate drivers without due process or the "right of explanation" as conceived by Kim and Routledge (2021). It can prohibit users from accessing its platform if they are identified as violating a company policy.

The effects of this power can be very significant. Uber's platform can introduce new forms of discrimination from either drivers or users, based on identifying characteristics, location, or the manipulation of Uber's platform policies. It can also, via inadequate vetting of drivers or users, seriously jeopardize the health and safety of either party.

Concerning its workers, Uber's aggressive marketing of its platform to potential drivers often has exaggerated the financial and non-financial benefits of the platform. In exchange for a low barrier to employment and some limited control of their working arrangements, its drivers experience downsides related to misclassification as independent contractors as well as the less freedom than independent contractors (Chai & Scully, 2019). Drivers cannot change how much Uber charges users, have asymmetric information compared to Uber, and must comply with various other Uber policies that have no control over. Misclassification also means drivers lack "wage and hour protections, anti-discrimination protections, workers' compensation, unemployment benefits, and the right to organize" (Rhinehart et al., 2021). This misclassification is one of the most significant effects of platformization, as it provides employers with an opportunity to fundamentally change working arrangements in ways that were until recently unprecedented.

At the worker-level, it is clear that platformization jeopardizes several labor rights as defined by the ILO. Uber's platform does not guarantee productive employment, skill development or prospects for personal development, maximum working hours, a fair income or minimum living wages, or data privacy. Drivers do not have freedom of association or the right to collectively bargain in many jurisdictions. Zipperer et al. (2021) show that platform workers materially suffer from a lack of these rights and protections. On a societal-level, platformization has led to market concentration and the distortion of markets, as Horan (2017), in the case of Uber, has shown. As platforms have proliferated, they have made social dialogue and universal social protection harder to achieve as rights. Unfortunately, governance of platforms and digital tools in general has not kept up with these developments.

Future taxonomic work aims for a more granular and sector-based analysis, and could complement legal, ethical, consumer-based, and technological evaluations of these changes. Altogether, these analyses could be used to fill the governance gap. For example, policymakers could proactively ensure that labor rights are preserved as the adoption of digital tools increases, evaluate how digital tools shape markets, and assess whether consumer welfare increases with the use various of digital tools.

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