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Socio-technical issues in the platform-mediated gig economy: A systematic literature review: An Annual Review of Information Science and Technology (ARIST) paper

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Abstract

The gig economy and gig work have grown quickly in recent years and have drawn much attention from researchers in different fields. Because the platform mediated gig economy is a relatively new phenomenon, studies have produced a range of interesting findings; of interest here are the socio-technical issues that this work has surfaced. This systematic literature review (SLR) provides a snapshot of a range of socio-technical issues raised in the last 12 years of literature focused on the platform mediated gig economy. Based on a sample of 515 papers gathered from nine databases in multiple disciplines, 132 were coded that specifically studied the gig economy, gig work, and gig workers. Three main socio-technical themes were identified: (1) the digital workplace, which includes information infrastructure and digital labor that are related to the nature of gig work and the user agency; (2) algorithmic management, which includes platform governance, performance management, information asymmetry, power asymmetry, and system manipulation, relying on a diverse set of technological tools including algorithms and big data analytics; (3) ethical design, as a relevant value set that gig workers expect from the platform, which includes trust, fairness, equality, privacy, and transparency. A social informatics perspective is used to rethink the relationship between gig workers and platforms, extract the socio-technical issues noted in prior research, and discuss the underexplored aspects of the platform mediated gig economy. The results draw attention to understudied yet critically important socio-technical issues in the gig economy that suggest short- and long-term opportunities for future research directions.

1 | INTRODUCTION

One of the more intriguing developments in the global economy over the last decade has been the emergence of gig work as a viable form of labor. Increasing numbers of people are engaging in the provision of goods and services that are not tied to single organizations or locations (Jarrett, 2022). While the definition remains contested, the platform-mediated gig economy can be characterized as a network of socio-technical systems that have complex technical infrastructures that support an online labor market where temporary and part-time

positions are filled by independent contractors and freelancers in a wide range of businesses from knowledge work to shared transportation to food delivery (Heinrich et al., 2022). Representative platforms in the gig economy include Upwork, Uber, and TaskRabbit. One key aspect is the triangular relationship between the worker producing the work or performing the service, the end-user of the service, and the digital intermediary which facilitates the whole process (Watson et al., 2021). Gig workers are short-term, temporary, or independent freelancers working for one or a variety of clients who are not employers in the traditional sense (Christiaens, 2022). The gig worker represents the supply side, and the client represents the demand side of digital labor.

Online platforms act as digital intermediaries matching demand with supply (Wang et al., 2021), primarily through "socio-technical phenomenon known as algorithmic management, or management-by-platform" (Jabagi et al., 2021, p. 6492). As a socio-technical system, the platform-mediated gig economy brings together three main user groups—the people selling their labor through the platform, those who seek to purchase their labor, and those who own, run, and maintain the platform (Scholz & Schneider, 2016). It is difficult to determine the size of the gig economy, in part because there are few official statistics available and the definition of a gig worker varies. The Gig Economy Data Hub (2022) estimates that between 25% and 35% of the total US workforce has engaged in gig work as their main or supplemental employment, that for 10%–13% as their primary form of work, and 1% do this work through online platforms, with the total workforce estimated to be 165.3 million people.

The rapid growth and global expansion of the gig economy has captured the attention of researchers in information science and related disciplines. As the body of literature grows, it becomes important to take stock of the research to assess the significant trends that currently characterize the scholarship of this phenomenon. There is considerable literature that has focused on economic issues in the gig economy (Jacques & Kristensson, 2019), legal issues (Pasquale, 2016), political implications (Woodside et al., 2021), and its historical development (Mahato et al., 2021). However, these approaches, while valuable, have not focused explicitly on the interactions among people, technology, and contexts in the gig economy. It is clear that digital platforms are at the center of a gig economy company's technical subsystem, gig workers are a significant part of the social subsystem, and each affects the other (Klein, 2014). What is less clear is the nature of the interactions and relationships that characterize these interdependent systems and shape the effectiveness of the work.

Therefore, of interest here are the socio-technical issues that are found in the gig economy research. Socio-technical theory originates in work done at the Tavistock Institute of Human Relations (Davis et al., 2014; Ngowi & Mvungi, 2018). One foundational assumption of socio-technical theory is that a system is "an entity that can be separated into parts, which are all simultaneously linked to each other in a specific way" (Vermaas et al., 2011, p. 68). In complex organizations there are always two socio-technical subsystems, one is technical and the other social (see Figure 1). The former includes the hardware, software, processes, and functionalities that combine to turn system inputs into outputs (Chen & Nath, 2008), requiring an analysis of the physical infrastructure. The latter includes the people who design, implement, operate, maintain, and use the technical subsystem, their relationships with each other and those in the organizational hierarchy, the organizational roles, rules, and responsibilities involved in this work, and the organizational culture and patterns of use, requiring an analysis of the social settings in which the system is embedded. Another foundational assumption is that these two subsystems are deeply and inextricably entangled in a single socio-technical system; people and technologies are in relationships of mutual shaping (Cartelli, 2007; Klein, 2014; Shin, 2014; Whitworth, 2009).

Therefore, the socio-technical issues we intend to explore in this review reflect the complex interactions and relationships between gig workers and platforms while also shedding light on the intended and unintended consequences of technology-enabled social changes in the platform-mediated gig economy. In other words, a social informatics approach is leveraged to spotlight and elucidate these socio-technical issues noted in literature in a more comprehensive and integrated manner.

This paper is organized as follows. After reviewing the current literature in the gig economy and describing the social informatics approach, the importance of focusing on socio-technical issues is discussed. The method used for this systematic literature review is described including research questions, search terms used, the databases searched, the principles of inclusion and exclusion, and the development of the coding scheme. This is followed by a description of the main findings and a discussion of the implications of the review.

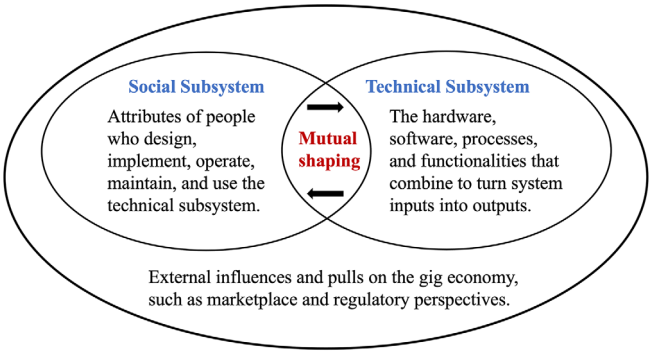

FIGURE 1 The socio-technical system.

2 | RELATED WORK

In this section, we summarize the existing literature review of platform-mediated gig economy (section 2.1), review those studies that touch on socio-technical issues in the platform-mediated gig economy (section 2.2), and introduce the social informatics approach we used to motivate our systematic literature review (section 2.3).

2.1 | Literature reviews of the platform-mediated gig economy

There have been a number of literature reviews that have focused on different aspects of the gig economy but not many that have examined socio-technical issues. These reviews may be sorted into three categories:

1. The use of bibliometric methods to map the intellectual structure of the gig economy research domain. For example, Batmunkh et al. (2022) conduct a systematic review to describe "publication trends, top contributing authors and their countries, most cited articles, keywords, and most contributing journals to the research" (p. 1) on the gig economy. Similarly, Gupta and Chauhan (2021) used bibliometrics to illustrate publication rates over time, most frequently used keywords, and most influential authors.
2. Assessments of the impacts of the gig economy on human resource management (HRM). Bhati's (2021) review focuses on extracting the theoretical approaches used in a sample of research literature in order to inform HRM and decision making. Le Brocq et al. (2022) use what they describe as a "moral economy lens" to review research that examines the impacts of gig economy firm ownership on ethical and unethical HRM practices directed towards gig workers. In contrast, Anwar et al. (2021) state that the goal of their review is to demonstrate that "the traditional role of HR is no longer viable" (p. 2).
3. Reviews of narrowly focused aspects of the gig economy, such as Fu et al. (2021), who focus primarily on the effects of digital platforms on economic development, individual empowerment, and inclusion, particularly in developing economies. Hati et al. (2021) review 10 years of research on Airbnb. Seghezzi et al. (2021) review literature focused on on-demand food delivery including perspectives of workers, customers, and restaurants, all of whom interact with various platforms. Shirolkar and Patil (2021) conduct a systematic review of sharing economy literature to uncover the major theoretical frameworks that are being used to analyze the sharing economy and what they call "collaborative consumption behavior." Wardhana et al. (2020) offer a systematic literature review of regulatory developments and issues in the gig economy. Zhu and Marjanovic (2021) review literature on platform cooperatives, an emerging organizational form in the gig economy.

2.2 | Socio-technical issues in the gig economy

We found seven articles that to varying degrees, touch on socio-technical issues in the gig economy, although four do so without labeling them as such. Gussek and Wiesche's (2022) review clarifies the "the forms and tasks of work in the gig economy" and calls for more research into crowdsourcing; they speculate that "the gig platform as a technology could become more autonomous and accordingly also take on a role as an actor in its own regard" (p. 12). Similarly, Stocker et al. (2021) review literature on platform economics and regulation and discuss characteristics of the gig economy including trust and information asymmetries, reputation and rating systems, safety and security, and power. Tan et al. (2021) are interested in surfacing the ethical issues that arise in the gig economy in terms of the new organization and nature of work and the new status of workers. Sources of ethical problems include algorithmic control and managerial oversight, reputation systems, and the precarity of gig work. Posing the question of the ways in which platform work is represented metaphorically, Vallas and Schor (2020) find that platforms are described as "entrepreneurial incubators, digital cages, accelerants of precarity, and chameleons adapting to their environments" (p. 273); arguing that these metaphors are limited, they propose that platforms are "permissive potentates." In doing so, they find in the literature the importance of platform governance and algorithmic management, the need to attend to the range of actors involved on both sides of the platform, and the effects of platforms being embedded in a larger socio-cultural ecosystem.

Three articles do frame some of their findings as socio-technical. Dillahunt et al. (2017) analyze a sample of papers drawn from the Association for Computing Machinery Digital Library to determine the nature of the contribution made by computing researchers to the understanding of the sharing economy. Two themes that are mentioned (2017) are socio-technical design of sharing economy platforms and the social relationships that develop among platform users. Kapoor et al. (2021) review literature that focuses on the social and technical characteristics of a platform ecosystem that includes the platform, its affordances, and the actors who use them

and explicitly invoke socio-technical theory to extract themes related to "four essential interacting dimensions—technical, tasks, actors, and structures" (p. 96). In the context of a review of the literature on the sharing economy, Sutherland and Jarrahi (2018) use a socio-technical approach to organize their findings around the concept of centralized and decentralized platform mediation and affordances. Findings themes of worker flexibility (or lack thereof), the importance of match-making, managing transactions, managing trust, platform control, surveillance, and algorithmic management, they conclude that "that perspectives on technology, and more importantly the socio-technical perspective, are currently lacking in the research on the sharing economy" (p. 25). What these articles have in common is that the search for socio-technical themes in the literatures they review is not the authors' primary focus, as is the case here.

2.3 | The social informatics approach

A social informatics approach examines the social aspects of information and communication technologies (ICT) and examines issues such as the ways in which ICT shapes social relations, and the ways in which social forces influence the uses of ICT (Kling, 2007). Social informatics is concerned with understanding the complex interrelationships between people, information and communication technologies, and their contexts of design and use (Fichman et al., 2015; Shin, 2014). It is important to employ a social informatics approach to study the gig economy because its socio-technical aspects have only been marginally studied. This approach is especially applicable for three reasons. First, the extracted socio-technical issues will influence the technology design process in the direction of optimizing organizational technical and social subsystems (Ngowi & Mvungi, 2018). According to Mumford (2000), it is "an approach that aims to give equal weight to social and technical issues when new work systems are being designed" (p. 125). Second, it can have "a significant impact on the social aspects of organizational design, most notably on the design of jobs and ways of organizing work" (Davis et al., 2014, p. 172). Third, socio-technical issues are proving useful in studying the online environment (Eason, 2013) and should therefore have currency in the study of the gig economy. This is particularly the case given that many organizations in the gig economy are moving from centralized and hierarchical structures to more decentralized and network-based organizational forms (Sutherland & Jarrahi, 2018).

With a social informatics approach to the gig economy, its social and technical features are seen as interrelated and interdependent components of a larger and more complex system (Kapoor et al., 2021). Such an approach allows researchers to explore the ways in which complex phenomena, such as the gig economy, operate and generate intended and unintended consequences. As well, research that makes use of this perspective can "be extended to provide practical recommendations for the design of a flexible, technology-rich work environment" (Chen & Nath, 2008, p. 44). Hence, this paper critically reviews the extent to which socio-technical thinking has been brought to a new domain—the gig economy. What kinds of socio-technical issues can be uncovered in the gig economy? This literature review will be the first attempt to solely focus on socio-technical issues in the context of the gig economy, provide a comprehensive understanding of those issues, and address any gaps in current literature.

3 | METHODOLOGY

One useful way to do this is with a systematic literature review (SLR) which, according to Kraus et al. (2020), is "a review of an existing body of literature that follows a transparent and reproducible methodology in searching, assessing its quality and synthesizing it, with a high level of objectivity" (p. 1026). SLRs are used to collect existing work on a specific topic, to summarize the knowledge related to a phenomenon of interest, to identify the current gaps in a research field, and to suggest avenues for future research (Busalim, 2016; Okoli, 2015). Tranfield et al. (2003) characterize SLRs as having a transparent process of data collection towards a goal of developing a more objective and reproducible synthesis of a literature domain. This type of review involves the systematic collection of relevant evidence that is evaluated against predetermined criteria (Linnenluecke et al., 2020). This SLR was informed by guidelines from Kitchenham (2004), Petticrew and Roberts (2008), and Pittaway (2011).

3.1 | Research questions

The first step was to establish that there was a need for this review (Kraus et al., 2020). After reviewing a sample of systematic and non-systematic reviews of the gig economy (see above), it was clear that there was a need for a systematic review of gig economy literature that focused explicitly on socio-technical issues. The next step was to develop the protocol that would guide the research, a key component of which is the research question

(Carrera-Rivera et al., 2022; Tranfield et al., 2003). The research questions that motivate this SLR are:

> **RQ1.** To what extent are socio-technical issues studied in the research literature that focuses on the platform-mediated gig economy and investigates the complex interrelationships among people, technologies, and their contexts of use?
>
> **RQ2.** What are the main socio-technical themes that characterize the findings, and what are the themes that are not well represented in the literature?

3.2 | Data collection

The next step was to develop the search strategy, specify the sources that would be used, and identify the search keywords. Arguing that the definitions of the gig and the sharing economy remain contested, several reviews explore the myriad versions found in literature (Schlagwein et al., 2020). To generate the most accurate search terms, "sharing economy" and "gig economy" were treated as different terms here. The former is a type of economic activity based on the sharing, acquiring, and provision of goods and services through the facilitation of an online platform (Cheng, 2016); the latter describes an economic system in which workers, such as freelancers and independent contractors, have high mobility and flexibility to engage in digital labor (Meijerink & Keegan, 2019). Similarly, Malik et al.'s (2021) review disambiguates the concepts of the "platform" and "gig" economy in order to bring some coherence to the literature and suggest fruitful paths for future research. Hence, we see "platform economy" as a broader term which includes both the sharing and gig economy.

Heeks (2017) also attempts to clarify and distinguish among the 30 different terms that emerge from research on the platform economy and digital labor. Even though some crowdsourcing platforms such as Amazon Mechanical Turk have similar attributes and coordinate crowd workers and their clients, they are not included as a part of the gig economy in this review. This is because "crowd work" and "gig work" have different task structures and skill requirements. Specifically, crowd work involves the completion of small, often micro-level tasks that are usually part of a larger project. These tasks can vary widely in complexity and may include data annotation, content moderation, image tagging, or other similar tasks (Alkhatib et al., 2017). Therefore, crowd work is not given to a specific individual but is offered to an undefined group of people. In contrast, gig work refers to short-term jobs or projects that are often related to specific skills or services and must "be done at a specific location and time or by a specific person who is responsible for the task but is not location bound" (Schmidt, 2017). In many articles, "on-demand work" (Shapiro, 2018) can describe both crowd work and gig work.

Therefore, to narrow down the focus and have a manageable corpus, the following search terms were used: "gig economy" OR "gig work" OR "gig worker(s)." Nine databases were selected: the ACM Digital Library, Emerald Insight, Wiley Online Library, SAGE Journals, Elsevier Science Direct, JSTOR, Springer LNCS, Taylor & Francis Online, and the Association for Information Systems eLibrary. These databases were chosen to cast a wide net for gig economy research originating in multiple disciplines including information systems, information science, computer science, management information systems, labor studies, human resource management, and sociology.

3.3 | Data selection

An iterative process of developing study selection criteria and procedures (Kitchenham, 2004) led to the criteria for inclusion and exclusion that governed the assembly of the corpus. The first criterion was that the articles had to be peer reviewed, which meant that searching was limited to journals and conference proceedings; this was a way to ensure that the corpus would include high quality articles and papers (Chapman, 2021). Articles and papers were included if they were not research in progress, written in English, accessible in full-text, and not duplicated in different databases. Preliminary searching indicated that prior to 2010, there was not a lot of research done on the gig economy, so the search window was limited to include literature published between 2010 and 2022. Title, abstract, and (author) keywords were searched which resulted in a total of 515 articles.

A second set of criteria was used to filter the data set. Using a SLR approach described by Busalim (2016) the abstract of each paper was coded for gig economy topics (the coding scheme is described below). Articles were excluded if they were purely conceptual or theoretical, primarily concerned with economic issues, for example, unemployment rates and the labor market (Huang et al., 2020), focused on legal and policy issues (Wardhana et al., 2020), for example, the issue of whether gig workers are employees or independent contractors, and that focused on psychological issues affecting gig workers (Crain et al., 2020), for example, mental health and emotional labor. These issues are not of interest here

TABLE 1 Databases used for search and papers collected from each.

Database	Collected	Excluded	Included
ACM Digital Library	48	23 (48%)	25 (52%)
Emerald Insight	29	22 (76%)	7 (24%)
Wiley Online Library	87	64 (74%)	23 (26%)
SAGE Journals	102	80 (78%)	22 (22%)
Elsevier Science Direct	41	36 (88%)	5 (12%)
JSTOR	18	16 (89%)	2 (11%)
Springer LNCS	57	46 (79%)	11 (21%)
Taylor & Francis Online	72	57 (77%)	15 (23%)
AIS eLibrary	61	39 (62%)	22 (38%)
Total	515	383	132

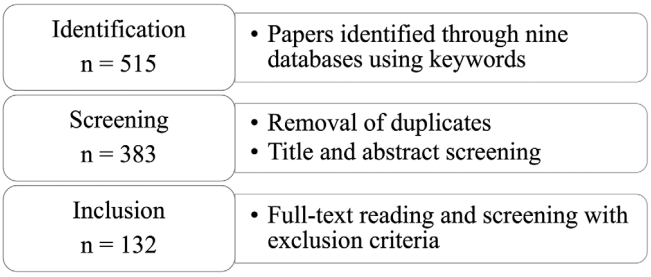

FIGURE 2 Criteria and data selection.

because they do not sit in the center of socio-technical interactions between gig workers and platforms. After the second round of filtering, 132 papers constituted the final corpus (see Table 1). Figure 2 depicts the process used to identify, screen, and build the corpus.

3.4 | Data analysis

An Excel spreadsheet was used to record data extracted from the 132 articles. The following categories were used to guide data analysis: year of publication, research site, and platforms/gig economy businesses studied. To answer the research questions, it was necessary to develop codes for the socio-technical issues that appeared in the literature. A grounded theory approach (Glaser & Strauss, 1967) was used to construct these issues as inductive reasoning can generate themes and patterns across qualitative data. To develop the codes, 28 articles (21%) were randomly selected and open-coded individually by the two authors after which they reviewed the themes and potential codes together to compile the initial codebook. Then, clear definitions were developed for the themes and the codes were grouped under the appropriate theme (see Table 2). All the labels for the themes, codes, and subcodes were extracted from the corpus and were based on the researchers' language as much as possible; the creation of new labels was avoided to increase the chances that the codebook can be reused in future gig economy research.

We noticed that many books also contain very relevant content about the gig economy (e.g., Altenried, 2022; Rosenblat, 2018; Scholz, 2017; Srnicek, 2017). However, books are very difficult to search in databases due to their coverage and copyright issues. It was therefore difficult to systematically include books with our search strategy. In addition, reviewing books causes problems with the coding process; while codes tend to be based on 10–25 pages of content from numerous articles, coding the books would greatly increase the frequency of each code skewing the results. Therefore, instead of coding the content from books and making it a part of our analysis, we used books to help define our codes and subcodes in the findings section.

4 | FINDINGS

4.1 | Overview

During the coding, the year of publication was extracted. Figure 3 shows that gig economy research started to explode after 2016 and more and more researchers have chosen to focus on socio-technical aspects in recent years. The papers in blue are the ones that passed our first round of screening and satisfied the inclusion criteria before we read the full-text. The papers in green were ones from which we were able to extract socio-technical issues from the content by coding; note that most of the issues were not identified in the text as socio-technical by the authors.

The research site was also collected during the coding except for papers that did not mention their research context. Table 3 shows that gig economy research has become very international, while studies in India, USA, South Africa, and China are the majority.

Similarly, many gig economy platforms have been studied all over the world (see Figure 4 for icons). Most frequently, Uber and Lyft are studied as representative platforms for the ride-sharing domain. Platforms in the food delivery domain include Deliveroo, Instacart, and Foodora, which is more used in EU countries. Upwork and Freelancers have been investigated to study online freelancers. TaskRabbit and Fiverr are classic gig work platforms where location-based individual workers could pick up all kinds of tasks, for example, furniture assembly, heavy lifting, and waiting in line. Platforms

TABLE 2 Coding scheme.

Theme	Codes	Subcodes
A Digital Workplace	A1 Information infrastructure	A11 digital divide
		A12 digital mediation
		A13 digital literacy
	A2 Digital labor	A21 identity gaining
		A22 online community
		A23 knowledge sharing
		A24 diversity & inclusion
	A3 User agency	A31 flexibility & autonomy
		A32 engagement & empowerment
		A33 affordance
		A34 professionalism
B Algorithmic Management	B1 Platform governance	B11 centralized design
		B12 surveillance & monitoring
		B13 algorithmic control
		B14 policy & regulation
	B2 Performance management	B21 rating & review system
		B22 evaluation & ranking
		B23 penalty & rewards
	B3 Information asymmetry	B31 lack of information
		B32 information deficit
		B33 information disclosure
		B34 lack of communication channel
	B4 Power asymmetry	B41 decreased user agency
		B42 social isolation
		B43 lack of bargaining power
	B5 System resistance	
C Ethical Design		C11 trust
		C12 fairness
		C13 equality
		C14 privacy
		C15 transparency

specifically for household tasks include ServiceHelp, HouseHelp, and HomeServes.

Based on the results of the analysis, some codes appear more often in the corpus than do others. This is shown in Figure 5, which depicts the percentage of mentions of each code in the 132 articles that were coded, for example, information infrastructure was mentioned in 50% of the articles. This figure shows that issues of user agency, performance management, platform governance, and power asymmetry were the most frequently mentioned socio-technical issues while information infrastructure and ethical design were less often the subject of research attention. These codes will be discussed in more detail below.

As Figure 5 only depicts the presence/absence of each code in the articles, Figure 6 displays the frequency of mentions of each code in total, and the results show that digital labor, user agency, and platform governance were more frequently mentioned; information infrastructure, information asymmetry, and ethical design were less mentioned. The relationship between Figures 5 and 6 indicates that even though some issues were mentioned in the articles, they are not discussed at length which leads to less frequency of mentions.

The total mentions, frequency, and percentage of subcodes in articles for each code will be presented in the following subsections with more detailed information.

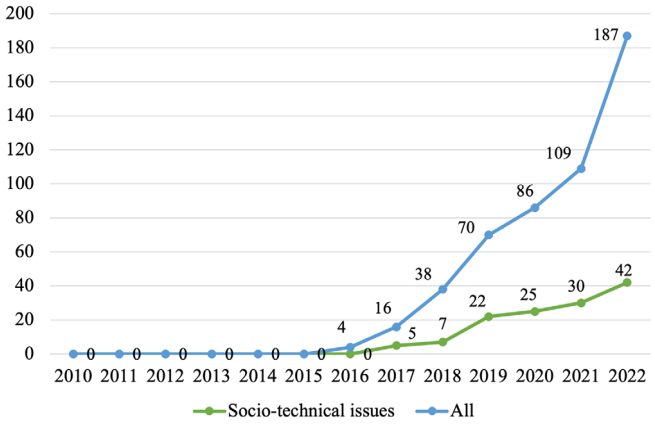

FIGURE 3 The year of publication of gig economy research.

TABLE 3 The frequency of gig economy research conducted in different areas.

Research context	Frequency
India	13
USA	12
South Africa	9
China	8
UK	4
Southeast Asia	3
Indonesia, Germany, Russia, Iran, Philippines	2
Argentina, Australia, Cambodia, Chile, France, Netherlands, Nigeria, Poland, South Korea, Thailand, Sweden	1

4.2 | Digital workplace

Broadly defined, there are two types of digital workplaces. The first is the result of a business such as a bank, consulting company or automotive company that undergoes a change in which they transform their operations and/or delivery of services to take advantage of digital technologies. This may or may not involve creating a remote workforce. Dery et al. (2017) found that to be successful, this type of digital workplace requires "employee connectedness" and "responsive leadership"; however, this version described the workplace in a conventional organization. The digital workplace in the gig economy differs because the platform company providing the workplace is not a conventional organization seeking to transform itself—it is born digital and is more of a mediator or aggregator bringing those seeking to hire labor with those seeking to sell their labor. This type of workplace, according to Woodcock and Graham (2019) can be characterized by

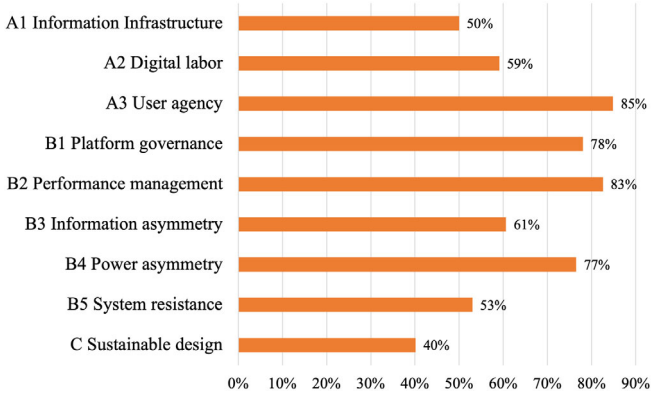

FIGURE 5 Percentage of mentions in articles for each code.

FIGURE 4 Icons of gig economy platforms studied in the current literature.

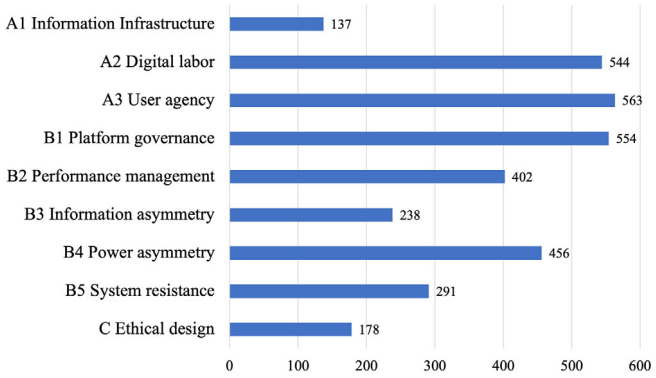

FIGURE 6 Frequency of total mentions in articles for each code.

"digital legibility and measurability of work, the ubiquity of mass connectivity and cheap technology, and the desire for flexibility for and from the worker" (p. 71).

4.2.1 | Information infrastructure

Gig economy platforms facilitate the exchange of labor and money by allowing gig workers to showcase and sell their skills to a global market (Huang et al., 2019). These platforms and the ICTs on which they depend are a digital workplace which is embedded in a global **information infrastructure (A1)** (Au-Yeung & Qiu, 2022). In the literature there are many examples that illustrate the extent to which gig workers are engaging with this larger information infrastructure (Lesala Khethisa et al., 2020). For instance, gig workers use Facebook groups, public forums, and WhatsApp to communicate with their clients or each other (Ghosh et al., 2022). PayPal, Amazon Pay, and other kinds of digital wallets help transactions occur safely and conveniently (Nash et al., 2018). Navigation apps (e.g., Google Map) are mostly used by Uber drivers and delivery people for local services (Newlands, 2021). In addition to these applications, mobile internet and digital devices are seen as basic equipment needed to join the gig economy (Behl, Jayawardena, et al., 2022). In the meantime, algorithms and machine learning tools are collecting and analyzing data invisibly to make sure the gig work is correctly assigned and efficiently done by workers with different skills (Dunn, 2020). The subcodes for information infrastructure are shown in Table 4.

Digital divide (A11) is a minor issue that draws attention from researchers since the gig economy is inherently dependent on internet access, computers, and smartphones. According to Woodcock and Graham (2019), access to digital platforms, as well as the skills and resources required to navigate them effectively, can vary widely. This results in disparities in opportunities and earnings among gig workers, with implications for broader socioeconomic inequalities. For example, potential gig workers without digital devices and internet access are denied access to platforms (Jack, 2020). Gig workers from South Africa found internet access very expensive compared to other third world countries (Chidoori & van Belle, 2020). To cope with this issue, most workers reported the use of public internet hotspots such as coffee shops, libraries, and universities to avoid paying Internet access fees (Anwar & Graham, 2020).

While examining the central role of the digital platform, scholars have studied **digital mediation (A12)**, a major role played by platforms that support the online gig economy (Wagner & Prester, 2019). Gig work empowered by the platforms can be seen as a "continuous intra-action unfolding in space and time" (Wu & Zheng, 2020, p. 12). The platforms match clients and workers and mediate their commercial and social interactions (Hulikal Muralidhar et al., 2022; Zhu & Marjanovic, 2021). Moreover, for most platforms, rather than simply "matching" workers and clients, they instead "act as digital work intermediaries that use algorithms to tightly manage a large, invisible workforce" (Duggan et al., 2020, p. 125). This kind of technological mediation has significant impacts on gig work (Anwar & Graham, 2021). For example, it shapes relationships between workers and their clients in a different way compared to offline gig work (Anjali Anwar et al., 2021). Also, it creates opportunities for gig workers to accomplish their jobs using digital technologies remotely without being tethered to specific locations (Nash et al., 2018), and many workers reported that they can continue working while traveling.

The most frequently mentioned issue in current literature dealing with the information infrastructure is **digital literacy (A13)**. The results showed that workers from poor backgrounds who did not have any higher education struggled to find and complete jobs on gig economy platforms due to lower rates of digital literacy (Blaising & Dabbish, 2022). A study conducted in South Africa found that the gig workers were mostly not literate enough to use navigation applications effectively, resulting in them often getting lost on their way to their jobs (Lesala Khethisa et al., 2020). There were incidents of early-career gig workers being "scammed" or performing unpaid labor because they were unable to verify whether clients had paid them due to a low platform literacy (Kinder et al., 2019). To better handle this kind of issue, some chose to use public communication channels to gain platform and algorithmic literacy from their global colleagues (Almoqbel & Wohn, 2019). Also,

TABLE 4 The total mentions, frequency, and percentage of subcodes in articles for A1.

Codes	Subcodes	Total mentions	# of articles	% of articles
A1 Information infrastructure	A11 digital divide	16	9	7%
	A12 digital mediation	45	21	16%
	A13 digital literacy	76	28	21%

workers joined other digital labor platforms, improving their knowledge about platform design and their knowledge of platform policy and regulations (Blaising et al., 2021). The results of the interviews conducted by Jarrahi and Sutherland (2019) with Upwork gig workers showed that algorithm sensemaking is a sophisticated, strategic, and multistep process that workers need to keep learning. Investigating risks in the gig work, Watkins (2022) pointed out that detecting and avoiding scam attacks have become new competencies for gig workers.

4.2.2 | Digital labor

Digital labor (A2) represents emergent forms of labor within digital workplaces as people interact with ICT such as digital platforms or algorithms (Jarrett, 2022). Digital labor can be paid or unpaid, and, unlike workers in traditional organizations, digital workers are socially and professionally entangled in the algorithmic and material aspects of the digital workplaces where they find work (Nash et al., 2018). The subcodes for digital labor are shown in Table 5.

The digital workplace and the technological affordances offered by platforms may act as catalysts in the process of gig workers' **identity gaining (A21)** (Bellesia et al., 2019). Establishing a professional identity is crucial, because as an emergent community, gig workers have to define their positions, work styles and skills, and exposure to compete in the larger work context (Mieruch & McFarlane, 2022). The nature of work in the platform-mediated gig economy leads gig workers to distance themselves from traditional organizations while developing different types of work identities that better align with their values, objectives, and preferences (Wong et al., 2021; Yang et al., 2022). For example, digital nomads have become so geographically mobile that they are free to work remotely using ICT and the internet from almost anywhere in the world (Wang et al., 2018). Some become online freelancers working on creative tasks and constantly negotiating with digital services, protocols, and algorithms (Schou & Bucher, 2022). These workers view themselves as entrepreneurs and exercise their agency in a way that sustains the efficiency of digital platforms (Blaising & Dabbish, 2022). In this context, identifying oneself as a self-made entrepreneur seems more rewarding than holding a low-skilled job in a highly hierarchical organization (Galière, 2020). However, some workers expressed frustration that "there is no human contact, the client simply does not see you as a person, just a faceless workhorse...Clients always look for a bargain" (Chidoori & van Belle, 2020, p. 112).

Online communities (A22) can bind a group of workers together as they share experiences; this can also prevent gig workers from feeling isolated and give them a sense of belonging (Posada, 2022), by providing social support such as caring, empathy, and trust (Kwan, 2022). The inter-worker communication via digital technologies can lead to the development of a sense of "networked solidarity," where gig workers provide each other with help and support (Le Breton & Galière, 2023). Many workers also find and provide support through social media platforms using, for example, Facebook groups and Reddit subforums (de la Vega et al., 2021). In China, gig workers use WeChat groups to discuss their work experiences (Vasudevan & Chan, 2022), compare earnings, complain, and buy or sell job-related equipment (Wu & Zheng, 2020). Similarly, drivers in South Africa share information via WhatsApp groups and sometimes meeting up when waiting at the airport (Mpofu et al., 2020). Seetharaman et al. (2021) mentioned that online communities can connect the most vulnerable delivery workers (i.e., migrants, new recruits), helping them to feel welcome and learn community norms. Digital nomads also benefit from online communities as they cope with their own challenges and opportunities. For example, there is a Digital Nomad Conference, as well as travel programs like Hacker Paradise where nomads can work and travel together. The Nomad list provides a variety of resources curated by and for digital nomads, from specific technical or work-related information to broader professional topics.

Unlike workers in traditional organizations who often receive formal job training, gig workers have to figure out the digital workplace and its algorithms on their own (Vasudevan & Chan, 2022), as most platforms only mediate the interactions between clients and workers and do not provide professional training (Blaising et al., 2018).

TABLE 5 The total mentions, frequency, and percentage of subcodes in articles for A2.

Codes	Subcodes	Total mentions	# of articles	% of articles
A2 Digital labor	A21 identity gaining	140	31	23%
	A22 online community	182	46	35%
	A23 knowledge sharing	187	54	41%
	A24 diversity & inclusion	35	17	13%

Therefore, **knowledge sharing (A23)** among gig workers typically occurs through third parties. For example, gig workers use social media networks to discuss a variety of interpersonal and work-related issues, share strategies on bidding, and run skills-training classes (Gandhi et al., 2019). There are also third parties that organize webinars on time management for and give advice on working remotely to gig workers, which helps them meet other gig workers and learn about their professional and work management styles (Kost et al., 2020). Tacit knowledge about algorithmic management, obtained individually in the course of gig workers' experiences, can then be more widely disseminated on online chat groups and public forums (Galière, 2020). For example, freelancers discuss how the Upwork ratings are calculated by the algorithm, how to recover from a low Job Success Score (JSS), and how to find and secure jobs without specific JSS requirements by using certain search terms. Some participants mentioned that they would message top-rated Fiverr freelancers to study how to interact with clients (Blaising & Dabbish, 2022).

The gig economy is seen as promising for **diversity and inclusion (A24)** because it enables remote working, flexible scheduling, and online anonymity (Shevchuk & Strebkov, 2021). Conversely, as an increasingly large population of workers participate in temporary gigs, it is critical for platforms to create a culture that embraces diversity and inclusion, which can be beneficial for a platform's growth in the long term (Kinder et al., 2019). For example, digital labor platforms offer economic inclusion for individuals who do not have the educational qualifications to secure traditional employment in local labor markets (Graham et al., 2017). Digital platforms can provide a source of income for middle aged persons who have experienced difficulties in obtaining jobs due to their age (Rachmawati et al., 2021). Gig economy work is also attractive for people with disabilities. For example, people who are hard of hearing or who have visual impairments can work when the online platform has accessibility features such as voice activation and screen reader compatibility (Harpur & Blanck, 2020). Gig economy platforms can empower women by providing the flexibility that they need to balance work with family obligations since women are still the major caregivers in most countries (Barzilay & Ben-David, 2016). Zhu and Marjanovic (2021) point out the potential for digital labor platforms to reduce gender and racial discrimination by controlling how and when user profiles are revealed during the matchmaking.

4.2.3 | User agency

In the context of the gig economy, **user agency (A3)** refers to the power that workers have in their relationships with the platforms or, more specifically, to their ability to control elements of their work lives (Beigi et al., 2022). As a socio-technical issue, user agency is enabled by many affordances in the digital workplace. The subcodes for user agency are shown in Table 6.

Flexibility and autonomy (A31) most often were defined as the amount of freedom a worker has to make decisions about aspects of their work, for example, what they work on, and when and how they work (Wang et al., 2021). It is a primary reason given for people to engage in gig work (Ens et al., 2018). Gig workers consistently commented that flexibility was important to them because it allowed them "to arrange work flexibly on a project basis" (de la Vega et al., 2021) giving them more freedom in their lifestyles (Cram et al., 2020). Flexibility was also seen to be as a basis for diversity and inclusion, creating opportunities for "groups who have long been excluded from the labor market, such as (ethnicized) youth, (female) individuals with caring responsibilities in the home, people living in remote areas, individuals with a disability" (Janssens & Zanoni, 2021, p. 11). One common expression of a worker's autonomy was a basic technique to free themselves from their employer's gaze; as one worker put it: "You can just turn off your mobile" (Heiland, 2021). Other indicators include control over time, sources of income, types of jobs sought and accepted (Mäntymäki et al., 2019). The concept, however, is somewhat contested in the literature, with some research arguing that flexibility and autonomy are more of a corporate marketing ploy than a reality of gig workers' lives (Raval & Pal, 2019). According to Waldkirch et al. (2021), these new forms of digitally mediated

TABLE 6 The total mentions, frequency, and percentage of subcodes in articles for A3.

Codes	Subcodes	Total mentions	# of articles	% of articles
A3 User agency	A31 flexibility & autonomy	226	88	67%
	A32 engagement & empowerment	119	57	43%
	A33 affordance	103	42	32%
	A34 professionalism	115	50	38%

work present workers with a high degree of flexibility and autonomy, while simultaneously shifting the power balance away from the workers due to new forms of control and surveillance.

In the context of the gig economy, **engagement and empowerment (A32)** describes the situation in which the platform makes an effort "to help motivate and empower workers to perform at a higher level" (Cram et al., 2020). From the platform company's perspective, engagement is an investment in human capital (van Doorn & Badger, 2020); from the workers' point of view, it is an opportunity to maximize income (Sutherland et al., 2020). For example, according to Meijerink et al. (2021), "platforms implement HRM practices related to motivation through employing compensation schemes such as piece-based reward schemes to incentivize gig workers to work long hours" (p. 215). Some platforms offer incentives for taking on more work (Tironi & Albornoz, 2022), in-house surveys, and support groups to provide assistance to gig workers (Duggan et al., 2020). Also, platforms employ gamification features to present work as a set of games through which drivers can win monetary or symbolic prizes (Nair, 2022). In general, empowerment is a multi-dimensional social process which refers to the outcomes of gig workers' interactions with platforms that enable them to filter jobs and refuse clients, to negotiate payment disputes, and to open them up to new experiences (Janssens & Zanoni, 2021). In some cases, it refers to workers' ability to engage in bargaining with the platform company (Wood et al., 2021). Another example is what Graham et al. (2017) call "skill arbitrage" or the "ability to sell their labor to whoever is willing to pay the most for it" (p. 8). Note that these latter two are not common features of many gig work situations.

In the context of the platform economy, "perceived affordances ... specify the range of possible activities" that are visible to the user (Norman, 1999); in this case the gig worker perceives **affordances (A33)** when using the platform (Blyth et al., 2022). Several studies have found that gig workers have been able to take advantage of affordances they have noticed on the platforms to organize their work (Jarrahi et al., 2020), search for clients, gather information about competitors (Blaising et al., 2018), earn privileges and perks (Pregenzer et al., 2020), receive guidance from the platform (Cram et al., 2020), and tag their achievements and skills (Kathuria et al., 2021); they have also explored the use of affordances for resistance (Newlands, 2021). On TaskRabbit, the communication is facilitated by the chat function, which allows gig workers to document and protect themselves against difficult customers at the later stages of the gig (Chan, 2022).

Professionalism (A34) describes the ways in which gig workers gather the knowledge to hone and refine the skills they need to become better at their jobs, with or without the platform company's direct involvement (van Doorn & Badger, 2020). Gig workers reported "seeking out gig employment to build skills that they may want to capitalize on in their future" (Jabbari et al., 2020, p. 8). For example, on certain platforms, upskilling is encouraged and gig workers can view each other's profiles and portfolios, allowing them to "borrow" from each other with the goal of improving the digital indicators of reputation embedded in their platform presence (de la Vega et al., 2021). In some cases the platform company sends the workers messages with tips and advice intended to help them improve their work (Bellesia et al., 2019). Some companies provide uniforms, training, and even an onboarding process for workers, encouraging them to self-identify as a "professional" (Anjali Anwar et al., 2021). Professionalism may also take the form of workers becoming activists, learning, for example, how to challenge management decisions (Wei & Thomas MacDonald, 2022). Workers with more experience sometimes make an effort to mentor new workers and participate in rookie training programs (Duggan et al., 2020). For example, they run in-person or online professional development events for digital nomads who only need to sign up on the website. Digital nomads also can follow weekly podcasts for more work-related information and professional collaboration (Sutherland & Jarrahi, 2017). Munoz et al. (2022) found that gig workers felt pressure to present themselves as professional through their profile image, while they emphasized "professionalism" as a critical component of how they represent themselves online.

4.3 | Algorithmic management

Algorithmic management is at the core of the gig work platform economy and represents a significant digital transformation with respect to the management of labor (Lee et al., 2015). Stated simply, algorithmic management shapes gig work (Scholz, 2017). For example, algorithmic management replaces human managers and assigns work, sets deadlines for the completion of tasks, provides information support, engages in monitoring, surveillance, and evaluation, and handles dispute resolution (Au-Yeung & Qiu, 2022; Chen et al., 2022). This type of management is critical to platform companies because management "originates from algorithms, the delivery of the management to the worker is provided by a technology interface (e.g., smartphone app) rather than by a human manager, and the management can be applied on a continual, real-time basis" (Cram et al., 2022, p. 427).

4.3.1 | Platform governance

Platform governance (B1) is a form of algorithmic management which allows the platforms to observe and shape gig workers' behavior through the use of centralized design (Cant, 2019; Cram et al., 2022), advanced algorithms, and regulations (Alacovska et al., 2022). It functions as an automated manifestation of managerial strategies, enabling platforms to present as a "boss" (Pregenzer et al., 2021). The subcodes for platform governance are shown in Table 7.

Algorithmic systems in the gig economy primarily make use of **centralized design (B11)** and are typically developed "in-house" by each company to align with its business models (Jarrahi et al., 2021), to connect and direct each party in the work arrangement, and to govern the dynamics of the working relationship (Duggan et al., 2020; Weber et al., 2022). Standards and policies that guide all parties' behaviors are also embedded in the algorithms (Gol et al., 2019), which means that they not only have a structuring power on each party, but also operate with efficiency, calculation, and objectivity (Galière, 2020). In the case of ridesharing platforms, the algorithms are flexible in their design to maximize drivers' available working hours and ride selections while keeping the incentives and drivers' earnings within a range assigned to the specific driver segment (Cant, 2019; Parth & Bathini, 2021). However, in a few cases, in contrast to the centralized control of many platforms, all members can be part of the system infrastructure and governance by acquiring a stake on the platform; for instance, CanYa, is an open ecosystem for peer-to-peer services and is based on a decentralized design (Gol et al., 2019).

Gig economy platforms can utilize "soft" forms of workforce **surveillance and monitoring (B12)** in a variety of ways to track how workers spend their time (Van Doorn & Badger, 2020; Gray & Suri, 2019). For example, on Upwork, if a screenshot is captured by the company while workers are playing games or using social media, they may not get paid (Anwar & Graham, 2020). The HouseHelp platform is able to record all interactions between workers and clients, including phone calls and messages via the app during the service (Anjali Anwar et al., 2021). Ridesharing and delivery platforms typically collect detailed spatiotemporal information in real time as workers are required to follow each step on the app, for example, arrival at the pick-up point or restaurant (Wu & Zheng, 2020). In addition, Uber has started tracking and detecting unsafe driving behaviors such as speeding, harsh braking, and using phones during driving (Baiyere et al., 2019). In another sense, surveillance and monitoring also can happen in the internal forums, when the conversations between workers are monitored by the platform and moderators frequently respond to posts from workers (Kinder et al., 2019). Gig workers doing content moderation are often subject to close surveillance, as their work is closely monitored by their employers (Roberts, 2019). Zhu and Marjanovic (2021) emphasized the harmful effects of platforms' surveillance mechanisms which include invading privacy, manipulations, discrimination on the basis of gender or race, since workers typically are not told how their data are managed and used (Howson et al., 2022). However, in India, Anjali Anwar et al. (2021) found that female workers' experiences with surveillance was a little different because they leveraged the platform's monitoring as a

TABLE 7 The total mentions, frequency, and percentage of subcodes in articles for B1.

Codes	Subcodes	Total mentions	# of articles	% of articles
B1 Platform governance	B11 centralized design	84	44	33%
	B12 surveillance & monitoring	240	70	53%
	B13 algorithmic control	182	69	52%
	B14 policy & regulation	48	25	19%

form of security, taking into account the various ways in which they were already subject to surveillance by different actors such as families and society. This kind of surveillance also happened during the COVID-19 pandemic, while the platforms imposed strict hygiene protocols for workers, for example, a daily temperature update and rigorous sanitization measures during the task performance (Anjali Anwar et al., 2022).

Algorithmic control (B13) refers to the case in which gig economy platforms leverage their user interfaces, experience designs, and data about gig workers to exercise control over their work (Behl, Rajagopal, et al., 2022). For example, workers must maintain a persistent connection to the platform, running up data costs, working under conditions of continuous monitoring (Newlands, 2022), having less control over the jobs for which they can compete (Polkowska & Mika, 2022), and submitting to human resource activities that control their work, such as accepting sanctions based on the rating system and constraints on their decision-making (Ens et al., 2018). Particularly, freelancing platforms have unique designs to prevent the development of relationships between clients and freelancers by specifying word limitations for communication (Hannák et al., 2017). In the case of food delivery services, the platforms usually provide a time limitation within which a food order must be delivered (Blaising & Dabbish, 2022), which has an impact on the restaurants' abilities to prepare food and couriers' abilities to deliver it (Wu & Zheng, 2020). To deal with this, some platforms introduce a reporting mechanism to find out when a restaurant is too slow in preparing food, making it possible to extend the time limits on delivery (Chen et al., 2022). The competitive work arrangements designed to enable gig workers to view each other's bids are found to be a source of downward pressure on pay rates (Wood et al., 2019a). When the platform has access to very detailed information based on GPS or other location systems, these data can be used to control the labor process and the volume of assigned tasks (Wei & Thomas MacDonald, 2022). Uber's surge pricing also can be seen as one kind of control by drawing drivers' attention to the heat map and affecting their decision making (Vasudevan & Chan, 2022). This level of algorithmic control can lead to a lack of transparency, arbitrary, and sometimes poor decision-making, and can inject potential bias into the digital workplace that can affect workers' livelihoods (Ravenelle, 2019a; Rosenblat, 2018).

The previous three kinds of control and surveillance all are shaped, to a great extent, by **policies and regulations (B14)**, rules and standards which are embedded in algorithmic management. The policy and regulation regimes shape the digital workplace in ways that benefit the company (van Doorn & Badger, 2020), sometimes benefit the gig worker (Yao, 2020), and sometimes place them as a distinct disadvantage (Gutiérrez Crocco & Atzeni, 2022; Mendonça et al., 2023). For example, freelancers on Upwork are constrained as they curate their online identities, which are critical to their finding work, because of "identity presentation restrictions due to the platform standards, policies, and identity surveillance mechanisms" (Munoz et al., 2022, p. 11). There is also a small literature that takes a critical approach to the ways in which platform companies enact their policies and regulations, for example, because of a "lack of gendered policy and infrastructure in gig platforms, women workers find it difficult to stand up for themselves when facing bias" (Ma et al., 2022, p. 5). Altenried (2022) describes the consequences of the application of gig platform policies and regulations as "digital Taylorism" which brings "new modes of standardization, decomposition, quantification, and surveillance of labor" (p. 7).

4.3.2 | Performance management

Performance management (B2) in the gig economy can be described as algorithmic management in practice (Panaligan & Curran, 2022; Popan, 2021). This facet of management involves evaluating, training, promoting, and appropriate employee compensation while removing human managers from the employer-employee relationship (Buckingham & Goodall, 2015). The large-scale analysis of data is used to incentivize intensive patterns of work, making use of a large reserve army of precarious labor when these standards are not met (Christiaens, 2022). Performance management includes the "range of activities engaged in by an organization to enhance the performance of a target person or group, with the ultimate purpose of improving organizational effectiveness" (Den Hartog et al., 2004, p. 557). The subcodes for performance management are shown in Table 8.

Rating and review systems (B21) are used in most gig economy platforms and take the form of reputation systems that are used to review and endorse workers' performance and ensure the work quality on platforms' side (Li et al., 2022; Ravenelle, 2019b). For example, on ServiceHelp, if a worker's aggregated rating falls below 4.5, the number of jobs allocated to that worker decreases (Gupta, 2020). In contrast, on Upwork, workers who are top rated and have positive reviews do not even have to bid for jobs, they are invited directly by clients (Anwar & Graham, 2020). In most cases, however, rating and review systems can have negative impacts. For instance, workers are disempowered and cannot easily push back

TABLE 8 The total mentions, frequency, and percentage of subcodes in articles for B2.

Codes	Subcodes	Total mentions	# of articles	% of articles
B2 Performance management	B21 rating & review system	209	87	66%
	B22 evaluation & ranking	92	36	27%
	B23 penalty & rewards	101	53	40%

against abusive clients because of the possibility of damaging their reputations (de la Vega et al., 2021), which are crucial to their continued ability to secure work (Nair, 2022). Many platforms use rating and review data to improve recommendation systems, which means that if the input data are biased (favoring workers of a certain gender and race), the algorithm may reinforce the real-world inequalities (Hannák et al., 2017). In some cases, it appears that the rating system acts in arbitrary ways and fails to distinguish high-quality from low-quality workers (Spitko, 2020). To protect workers from abusive clients, a gig economy platform which offers legal services uses a review appeal mechanism and deletes negative reviews (Yao, 2020). On Topcoder, the review system is not only used to provide feedback about workers, but also used to check the quality of work, as these reviewers are selected and promoted from the pool of highly skilled or experienced workers (Gol et al., 2019). During the COVID-19 pandemic, platforms even introduced "hygiene ratings" for gig workers assessed by the customers (Anjali Anwar et al., 2022).

Gig economy platforms use sophisticated metrics to **evaluate and rank (B22)** workers, including but not limited to ratings, reviews, everyday interaction logs, and data collected from other sources (Chan, 2022; Gutiérrez Crocco & Atzeni, 2022). The evaluation metrics also take a gig worker's portfolio completion and online activity into consideration (Shevchuk et al., 2021). On Upwork, the platform uses a ranking tool called the JSS which affects gig worker's ability to bid for jobs; Kinder et al. (2019) found that it is difficult for newcomers to get a high JSS until they complete some contracts that result in good reviews. Similarly, Fiverr assigns a "level" to workers based on their activity, performance, and reputation, and workers with higher levels obtain certain benefits when bidding for jobs (Huang et al., 2019). Therefore, there is an entry barrier for new workers, which leads many to bid lower for the same jobs at the very beginning of their employment than will more established workers (Lukac & Grow, 2021). Some gig workers reported developing work-arounds, taking many short-term jobs, or breaking up a bigger project into smaller jobs for obtaining more contracts and ratings (Sutherland et al., 2020). Blaising et al. (2021) pointed out another kind of barrier—it is hard for gig workers to transfer their experience and reputation across platforms. Similar to ranking, online freelance job markets also provide skill signals to endorse gig workers' higher expertise levels and work quality (Kathuria et al., 2021).

Penalty and reward (B23) then can be assigned based on workers' performance in evaluation and ranking (Ma et al., 2022; Rosenblat, 2018). Deactivation is a common penalty used by platforms to punish underperforming gig workers based on their activity, reputation, and work records (Thebault-Spieker et al., 2017). For instance, DoorDash's policy states that it will deactivate workers if their last 100 ratings average less than 4.2 out of 5 stars (Griesbach et al., 2019), similarly, ridesharing drivers are threatened with having their accounts deactivated if they cancel too many orders (Jiang et al., 2021) or fall below a certain rating (Weber et al., 2022). Uber introduced a real-time ID check that asks drivers to take a "live" photo of themselves, and if the photo does not match their profile picture, the account can be suspended (Wiener et al., 2021). In some cases, the deactivation is executed by customers/clients, as they are free to end any workers' contract at any time without notice, "firing them on the spot" (Ravenelle, 2019a, 2019b). Because of the fear of immediately losing their jobs and income, gig workers are disciplined to adhere to many arbitrary rules and designs, for example, keeping the cancellation rate at a low level (Pregenzer et al., 2020). In terms of rewards, ridesharing platforms provide "rider compliments" section, which present 5-star ratings and display badges that can be a significant source of motivation for drivers (Pregenzer et al., 2020); this is also done by platforms for freelancers (Blaising & Dabbish, 2022). HomeServers introduced a "Gold Status" incentive system, rewarding workers who complete over 60 jobs per month and maintain a 4.8 or higher average rating (Anjali Anwar et al., 2021). TaskRabbit rewards workers who have met platform-specified criteria with "Elite" badges (Jabagi et al., 2019).

4.3.3 | Information asymmetry

According to Clarkson et al. (2007), **information asymmetry (B3)** "exists when a party or parties possess greater informational awareness pertinent to effective participation in a given situation relative to other

TABLE 9 The total mentions, frequency, and percentage of subcodes in articles for B3.

Codes	Subcodes	Total mentions	# of articles	% of articles
B3 Information asymmetry	B31 lack of information	52	31	23%
	B32 information deficit	123	43	33%
	B33 information disclosure	63	30	23%
	B34 lack of inner communication channel	22	16	12%

participating parties" (p. 828). In the context of the gig economy, the balance is typically tipped in favor of the platform, which, through algorithmic management (Chan, 2022; Maffie, 2023), maintains an asymmetric level of knowledge and computational capacities that gives it a distinct advantage over the gig worker (Heiland, 2021; Wiener et al., 2021). Asymmetric information, drawn from gig workers' social interactions with the platform and clients, is used to nudge their behavior in directions that benefit platform owners (Christiaens, 2022). The subcodes for information asymmetry are shown in Table 9.

One type of information asymmetry, a **lack of information (B31)**, means that the information was not available by the platforms or clients to gig workers. It took several different forms, including, for example, a lack of direct guidance or mentorship for gig workers joining the platform (Blaising et al., 2021; Kost et al., 2020), the absence of information that could be provided by clients, reasons for canceling the order, and the intentionally omitted key information about their businesses or tasks (Mäntymäki et al., 2019; Prabhat et al., 2019). There are some instances in which the lack of information provided by the platform can place the gig worker in difficult and potentially dangerous situations (Lesala Khethisa et al., 2020). It is also the case that potentially relevant information generated during the work, such as poor client behavior, may be invisible to the platform, placing the gig worker at a disadvantage when, for example, receiving an undeserved negative review (Newlands, 2021).

Another type of information asymmetry, **information deficit (B32)**, is different from the lack of information and focuses more on the aspects of accessibility, which means that the information was available and in the possession of the platform but was withheld from the gig workers (Lord et al., 2023). Platforms contribute to information deficits by black-boxing information about their algorithmic management (Mendonça & Kougiannou, 2023), omitting certain information to restrict workers' choices (Alacovska et al., 2022), and acting as gatekeepers (Chan, 2022), restricting the ability of gig workers to share their profile information outside of the platform (Jarrahi et al., 2021). In the meantime, some opaque membership norms and lack of shared context often make accessible information less trustworthy and more inefficient (Blaising & Dabbish, 2022). However, the platforms can argue that they deliberately create "algorithmic opacity," as a strategy for organizational management, to maintain competitive advantages, protect intellectual property, and prevent malicious users from gaming the system (Weber et al., 2022). The information deficit could be exploited for scams later, as gig workers lack helpful knowledge to detect discrepancies between actual and fraudulent platform activities (Watkins, 2022).

Information disclosure (B33) describes the information flow from the platform to the worker (Puram et al., 2021). This flow can take several forms. On one platform, a forum is created for each project in which gig workers can discuss issues related to the project (Gol et al., 2019). When a gig worker reaches a certain level on some platforms, there is an additional level of information disclosure; they can review their ratings at any time, receive email when their rating dips below an acceptable level, receive motivational messages, and sometimes have access to information about the client (Posada & Shade, 2020; Wiener et al., 2021). These affordances are intended to be analogues of typical organizational communication between employees and managers (Jabagi et al., 2019). One platform actually disseminated political campaign information to gig workers (Howson et al., 2022). Platforms provide performance metrics for riders, for example, average speed, number of deliveries, and average waiting time (Newlands, 2022). The updated Uber app also employed text and iconography to emphasize the driver's personal metrics (Vasudevan & Chan, 2022).

The **lack of an inner communication channel (B34)** describes the situation in which information exchange between platform employees and gig workers is restricted or even non-existent (Lesala Khethisa et al., 2020). Platforms restrict the ability of workers to easily communicate with clients and each other through the platform interface leading some to move their communications to fora outside of the platform's boundaries (Seetharaman et al., 2021). Prior to the pandemic, platforms were able to provide information via official helpline call services and direct messaging between workers and managers; however, those

services have been limited during the pandemic (Anjali Anwar et al., 2022).

4.3.4 | Power asymmetry

In the gig economy, power involves the complex interactions among the platform, the worker, and the client and is inherently unbalanced (Van Doorn & Badger, 2020). **Power asymmetry (B4)** is an important outcome of algorithmic management that, based on the literature collected and analyzed, can be decomposed into six attributes (Wood & Lehdonvirta, 2022). In general, power asymmetry exists when differences in statuses and roles among actors within a complex organizational hierarchy lead to differences in their abilities to initiate or prevent actions from taking place (Au-Yeung & Qiu, 2022; Scholz, 2017). It is "a decisive factor in how all kinds of relationships develop" (Fousiani, 2022, p. 1) and to a great extent shapes the gig economy in terms of platform structure and work processes (Baiyere et al., 2019). The subcodes for power asymmetry are shown in Table 10.

One of the ways that power asymmetry can impact gig workers is through **decreasing user agency (B41)**, constraining their ability to act and restricting their autonomy (selecting jobs, modifying tasks) (Huang, 2023). This took several forms which had in common constraints on gig workers' daily work routines originating in the "operational choices embedded within a platform's architecture [that] implicitly shape platform workers' autonomy such that platforms can be either autonomy supportive or controlling" (Jabagi et al., 2021, p. 6494). In some cases, user agency is constrained by technological affordances of the platform that encourage workers' awareness of the precarity of gig work (Behl, Jayawardena, et al., 2022; Huber et al., 2022; Woodcock & Graham, 2019), through, for example, the possibility of being deactivated at any time, and increasing the difficulty of connecting with other workers (Jabagi et al., 2019). From the perspective of the company, a goal of using affordances such as behavioral nudges and scheduling prompts to decrease user agency is to engender and maintain a state of dependence among the workers (Ravenelle, 2019a, 2019b; Seetharaman et al., 2021).

Social isolation (B42) is a lack of social connections and a state in which a person is not involved in social networks (Li et al., 2022). In the context of the gig economy, the relevant phenomenon is workplace isolation, in which social support, social interaction, learning opportunities, and professional development opportunities are missing and the work is characterized by physical and social isolation (Sahai et al., 2020). It means that "the flexibility and independence of gig work may come at a social cost" (Seetharaman et al., 2021, p. 4). In general, because gig workers tend to be a distributed workforce and their organizational interactions are with algorithmic rather than human management, they tend to work on short-lived tasks in isolation, with limited opportunities for collaboration, and a growing sense of marginalization (Ens, 2019). For location-based gig work, the isolation, with its accompanying tedium, loneliness, and alienation, may be a characteristic of the job (Wood et al., 2019b). For knowledge work, for which platforms can draw on an international labor pool, the lack of co-presence means workers cannot easily develop supportive social relationships or networks (Soriano & Cabañes, 2020). A consequence, then, of the normal operations of gig economy platforms is that gig workers may feel less connected to their work and to other gig workers and less in control of their lives (Jones, 2021).

Lack of bargaining power (B43) is a consequence of social isolation and of platform activity that attempts to prevent gig workers from gaining power, authority, and/or influence (Beigi et al., 2022). It can take the form of controlling the competition among workers for jobs or tasks, controlling how the work is done, placing barriers between the gig worker and the client, and contractually enforcing the removal of some rights from the gig worker (Spitko, 2020). Platform design and operation, pervasive monitoring and surveillance, the rating and evaluation systems, the tendency to value the client over the worker (Chan, 2022), and the distributed nature of gig work make it difficult for workers to gain any type of significant bargaining power and when they do, it is characterized by power asymmetry tilted in favor of the platform (Cieslik et al., 2022; Zhu & Marjanovic, 2021). Fleitoukh and Toyama (2020) provide a clear summary of the core

TABLE 10 The total mentions, frequency, and percentage of subcodes in articles for B4.

Codes	Subcodes	Total mentions	# of articles	% of articles
B4 Power asymmetry	B41 decreased user agency	316	78	59%
	B42 social isolation	49	32	24%
	B43 lack of bargaining power	91	50	38%

TABLE 11 The total mentions, frequency, and percentage of B5 in articles.

Codes	Total mentions	# of articles	% of articles
B5 System resistance	291	70	53%

issue "[t]he bargaining power of the worker is truncated when operating through a digital tool" (p. 3). There is no space to bargain or challenge the system.

4.3.5 | System resistance

System resistance (B5) occurs when gig workers gain in-depth knowledge about a platform and can manipulate it to their own advantage (Cant, 2019). The resistance behaviors can range from mild forms, such as gaming of the system, to more severe forms, such as protests and strikes (Pregenzer et al., 2021; Rubert, 2022; Scholz, 2017). The subcodes for this socio-technical issue overlap to an extent because scholars tend to use different terms to describe similar phenomena, therefore, we did not account for each (see Table 11). The most frequently mentioned one is **bypassing the platform**, which means to work around the system (Yoon & Woo, 2020). For example, some delivery workers choose to turn off the order assignment system when unwanted orders are assigned (Chen et al., 2022), or make private arrangements with clients (Lesala Khethisa et al., 2020). Gig workers also learned how to play with rating systems in their own ways to achieve a higher work performance rating. For example, newcomers, who have just started working on a platform can buy good reviews and high ratings to build up their reputation quickly (Anwar & Graham, 2020). Uber drivers claimed that passengers did not always know what to base their ratings on, so they printed a sign explaining that a 5 is the only "acceptable" score in the car (Ma et al., 2018). Drivers also experience passengers who are likely to give low ratings and try to avoid them later (Jiang et al., 2021). Gig workers learned how to set up multiple accounts as clients or buyers to gain inside knowledge from the other perspective (Blaising et al., 2018). Jack (2020) found that ride-hailing platform drivers in Beijing joined several ride-hailing-platforms and built plugins to compare which platform offers the best wage at a given time. The multi-platforming was found as a coping strategy for gig workers to survive and bargain with platforms (Au-Yeung & Qiu, 2022).

Other than resisting the platform, workers also have been found to **resist clients** by enforcing price norms so that other workers do not accept work from low paying clients, as well as withholding work and threatening to end contracts with bad clients (Wood et al., 2021). Gig workers learned to leave negative feedback and give low ratings to affect clients' reputation on a platform (Anwar & Graham, 2020), so as to regain work autonomy and bargaining power in the long term. Galière (2020) concluded that food-delivery workers can identify surveillance flaws and game the platform based on knowledge acquired through experience and informal socialization with other food-delivery workers. Some workers went further and broke rules by using fake-GPS apps which made it possible to hide the actual individual GPS signal (Heiland, 2021). Over time, gig workers are finding new and more sophisticated means for resistance, as they learn which tactics are most effective (van Doorn & Badger, 2020), for example, lobbying for safety equipment, joining unions, participating in media coverage, and starting court proceedings (Riordan et al., 2022).

Since all the interactions are digitally mediated, gig workers can also **outsource** their own tasks to a friend or a family with little risk of clients' awareness and complete more tasks than they can on their own (Newlands, 2021). Some platforms are designed for deliverers to outsource their orders if they need help, by posting in a certain group chat, if someone else responds within 3 min, the order can be transferred to that person to be delivered (Chen et al., 2022). Moreover, there is a small hub for gig workers emerging who often collaborate with one another in the north-eastern parts of Nairobi, the capital of Kenya (Anwar & Graham, 2020).

4.4 | Ethical design

Ethical design has been a concern among the HCI and UX communities for most of this century and has been typically framed to help fight carbon-producing digital waste by focusing on making products as accessible as possible and reducing the data load of that product (Soden et al., 2021). Ethical design follows two paths; mitigating the "material impact of software and hardware, and sustainability through design," and encouraging individuals to reduce their energy consumption (Bornes, 2023, p. 1). Common to both paths is the explicit set of values embedded in ethical design practice which, in the context of the gig economy, shapes the design of the platform, which in turn, shapes the design of gig work and the experiences of gig workers as they interact with the platform. There is a set of values that should be considered when designing gig economy platforms and

Codes	Total mentions	# of articles	% of articles
C1 Trust	22	15	11%
C2 Fairness	24	13	10%
C3 Equality	70	30	23%
C4 Privacy	12	7	5%
C5 Transparency	50	19	14%

TABLE 12 The total mentions, frequency, and percentage of subcodes in articles for the code ethical design.

algorithms, so that workers can have more healthy, safer, and sustainable working conditions. The codes for ethical design are shown in Table 12.

Because gig economy platforms are sensitive to client relationship management in the digital space, trust and reputation are social resources that play important roles in facilitating reliable transactions (Sutherland & Jarrahi, 2017). For example, rating systems were developed to build **trust (C1)** between workers and customers/clients, where the parties have an equal opportunity to review each other's performance (Lee, 2018). However, some of these systems lack transparency and accountability so that, for example, drivers do not know about passengers' complaints, which leads to suspicion of and a lack of trust in the platforms (Ma et al., 2018). Beyond rating and review systems, certain kinds of evaluation tools were developed to maintain the trusting relationships between freelancers and clients, for example, the JSS of the Upwork platform (Kinder et al., 2019). Similarly, social badging has been leveraged to ensure work quality and clients' trust in the process (Jabagi et al., 2019). Interestingly, Indian beauty workers benefited from the centralized control of platforms when their families were more comfortable with them working in strangers' homes because their families trusted the platform to monitor them (Anjali Anwar et al., 2021).

As an increasingly large and diverse population of workers chooses to join the gig economy and build their careers in a digital workplace, it is critical for platforms to create a culture that embraces **fairness (C2)** (Chibanda et al., 2022; Krishna, 2020). Prior research found that many rideshare drivers suffered from unfair labor practices because they were defined by the platform as independent contractors (Fleitoukh & Toyama, 2020). For example, Uber can immediately block drivers based on a single negative review without giving them an opportunity to appeal (Anjali Anwar et al., 2021). Similarly, drivers were concerned about deactivation without notice, when they would suddenly lose the work opportunity and income without warning (Mpofu et al., 2020). The lack of transparency of the rating and review systems also leads workers to doubt the fairness of job assessments (Anjali Anwar et al., 2021). However, for some food delivery platforms, the system will decide why negative reviews are left and who should account for them, and the delivery workers could, in some cases, avoid punishments (Chen et al., 2022). Due to the power asymmetry, algorithmic management has been perceived by gig workers, in many cases, as unfair and arbitrary (Pregenzer et al., 2021). Especially for newcomers, platform algorithms can produce unfair outcomes because they are designed to favor already successful workers (Lukac & Grow, 2021). To make gig economy platforms fairer and more transparent, Tan et al. (2021) proposed to employ algorithmic audit or algorithmic impact assessments.

Ideally, since online platforms act as intermediaries, gig workers enjoy a great degree of anonymity in a potentially inclusive environment, which helps to offset the bias and discrimination found in many offline workplaces and promote **equality (C3)** (Barzilay & Ben-David, 2016). Although the digital workplace is expected to eliminate some of the identity bias when work relationships are mostly based on reputations and evaluation scores, gender and race biases are still reflected in rating and review systems (Gupta, 2020). Tan et al. (2021) found evidence of discrimination among different groups of workers, especially women, ethnic minorities, and workers in low-income countries. Many platforms use rating and review data to improve recommendation systems, which means if the input data contains biased information, the algorithm may reinforce the real-world inequalities (Hannák et al., 2017). Discrimination can also be derived from the information asymmetry between workers and consumers since workers usually receive less information about consumers (Liang et al., 2018). Instacart workers suspect that there is pay discrimination embedded in algorithmic pricing systems, thinking that their personal information is being used to create differential pay scales (Griesbach et al., 2019). In another example of inequality, non-white online English teachers experienced race-based discrimination from students and their parents who expected a white teacher (Curran, 2021). To cope with inequality online, some platforms leverage technical designs, for example, giving workers pseudonyms to minimize the racial discrimination (Tan et al., 2021).

Monitoring for performance management can be a violation of gig workers' **privacy (C4)** and data protection (Gupta, 2020). Similarly, algorithmic control relies on collecting a lot of information from workers and consumers, especially on the workers' side (Sannon et al., 2022). This could raise ethical and privacy challenges if workers' personal data are misused (Rogers, 2023). Notably under the EU's General Data Protection Regulation, gig workers have data protection rights allowing them "to resist workplace surveillance and profiling, and to challenge reputation scores and other forms of algorithmic management" (Tan et al., 2021, p. 8). In addition to workers' log data, platforms further capitalized on workers' privacy, through collection of personal data without the knowledge of the workers (Ghosh et al., 2022).

Bucher et al. (2021) provides a clear statement about the importance of platform **transparency (C5)**: "algorithmic management ... is characterized by an inherent opaqueness, driven by a lack of disclosure about data sources, evaluation mechanisms that operate 'under the surface', and the difficulty for workers to properly interpret algorithmic outcomes" (p. 2). For example, Ma et al. (2018) pointed out that the lack of transparency "opens the door" to biased rating, if the review and rating process is opaque. Platforms' lack of transparency contributes to gig workers' low level of digital literacy, which means that gig workers do not know how to meet certain performance standards to earn higher job success scores (Schou & Bucher, 2022). However, the gig economy has the potential to increase female participation by providing more transparent pay rates online (Foong et al., 2018). In the future, clearer guidelines and disclosure of platforms' evaluation procedures could allow gig workers to gain a better understanding of algorithmic management and practice more "quality" work (Kinder et al., 2019). Jarrahi et al. (2020) reported that Upwork provides a certain level of transparency by offering gig workers information about "how the platform works and encouraging certain professional behaviors and conformity with platform policies" (p. 22). On Upwork, freelancers' total platform earnings, number of projects and hours worked, and work history (including in-progress and completed projects) are visible to other freelancers (Blaising & Dabbish, 2022).

5 | DISCUSSION

5.1 | Trends of socio-technical issues investigated in gig economy research

This SLR has examined the literature on the gig economy between 2010 and 2022, as indicated in Table 1. Early work between 2010 and 2016 focused primarily on the technical components of platforms and the affordances of mobile applications, mirroring the early stages of rideshare as the first companies appeared in the digital economy (Cheng, 2016). Beginning in 2016, the gig economy entered the hype cycle and became a topic of popular discourse and more researchers turned their attention to its structures and processes (Graham et al., 2017). The number of published research papers began to increase accompanying the rapid growth of both platform companies and gig workers.

The analysis reveals that a significant number of researchers are investigating socio-technical issues in the gig economy in recent years. In many papers, researchers have made clear connections between gig workers, platform interfaces, apps, and various contexts of use, all of which align with the concept of socio-technical thinking as described earlier. However, the term "socio-technical" was barely mentioned explicitly. By making use of a social informatics approach in a way analogous to a sensitizing concept (Blumer, 1986), we are able to spotlight those issues in the corpus with a specific purpose. Hence, it demonstrates the value of using a social informatics approach to inform an SLR for understanding a new socio-technical phenomenon and also for directing attention to its intended and unintended consequences (Kling, 2007).

Our analysis has shown that gig economy research has become very international. Even though the majority of the research continues to be done in the United States and Asia (Fleitoukh & Toyama, 2020), current research is beginning to focus on the global South (Gutiérrez Crocco & Atzeni, 2022) and Europe (Newlands, 2022), where different socio-technical issues might arise. It is also important to point out that gig economy research has become very multidisciplinary, as scholars from information science, computer science, to labor studies (Foong et al., 2018) and sociology (Kwan, 2022) all have been contributing to this body of knowledge. Since each discipline has its own perspective when diving into the gig economy research, the multidisciplinary findings facilitate a more comprehensive insight.

Moreover, the examination of different gig work occupations has recently become popular, indicating the trend of a higher level of scrutiny of gig work in the different contexts of use. For example, early on most of the empirical studies in gig work were conducted with rideshare drivers (Rosenblat & Stark, 2016) and delivery workers (Puram et al., 2021), but more and more research has turned to other kinds of occupations producing distinctive findings about new types of gig workers, such as beauty workers (Anjali Anwar et al., 2022), online English teachers (Panaligan & Curran, 2022), and legal consultants (Yao, 2020). Interest is also increasing in

studying different characteristics of gig workers such as gender (Ma et al., 2022) and disability. Most of these studies seem to be investigating whether the gendered workplace with its inequalities continues in the gig economy (Gupta, 2020). This has led to special attention given to bias and discrimination in online labor markets (Hannák et al., 2017).

Last but not least, the terms used to describe those socio-technical issues in the research vary widely. In this SLR, we tried our best to extract the most common terms used in the literature for our codebook, while being aware of the possibility that different scholars might use the same terms but give them different meanings. By providing this list of terms, this SLR could help researchers investigate socio-technical issues in the gig economy with a common understanding and a common language. We hope it is also useful for scholars interested in learning about the gig economy.

5.2 | Understudied socio-technical issues in the gig economy

Our review of the literature found that some socio-technical issues are less studied than others, as shown in Figure 7, the word cloud illustrates the frequency of total mentions for each subcode, and smaller size of font means fewer mentions in the corpus. With this figure, we are able to discuss the understudied socio-technical issues at the subcode level.

For example, digital literacy, digital mediation, and the digital divide, under the information infrastructure code, while vital, remain understudied. The first two were addressed in less than a quarter of the papers, while the third appeared in only 7% of the papers. The lack of attention may be partially explained by the fact that for the decade under study, the majority of the research has focused on the gig economy in the United States, Europe, and Asia, regions of the globe where these subcodes may represent more settled issues. In the last 2 or 3 years, scholars have begun to study the gig economy in the global South (Chibanda et al., 2022), Africa (Chidoori & van Belle, 2020), and India (Fleitoukh & Toyama, 2020), regions where digital literacy, mediation, and the divide (in its many forms) are more pressing problems that are foregrounded in the research, and this is a welcome trend that we hope continues.

FIGURE 7 Word cloud based on total mentions of subcodes in each category.

Meanwhile, diversity and inclusion remains a largely underexplored domain. Early narratives emphasized the potential of the gig economy to be welcoming and inclusive and in general platforms have the potential to reduce gender or racial discrimination by, for example, controlling how and when user profiles are revealed (Zhu & Marjanovic, 2021). However, recent research has critically examined these narratives, raising questions about their validity (Barzilay & Ben-David, 2016) and there are increasing calls for regulating platforms through law and policy rather than just through design. It is apparent that this issue deserves much more research attention and scrutiny. While the studies in our corpus on this issue tend to use more quantitative methods, future research can conduct interviews with women and other underrepresented populations to understand their working experiences and their perceptions of discrimination and other unfair treatments that happen in their gig work (Curran, 2021).

Policy and regulation, which play a special role in the development of the platform-mediated gig economy, only appeared in 19% of the papers, highlighting the need for more in-depth and sustained research. We are aware that there is a large and interesting literature that focuses on laws, policies and regulations that impact the gig economy. However, because of our primary interest in the socio-technical interactions between gig workers and platforms, the types of policies and regulations extracted were those that were clearly implicated in platform governance because they relate to the ways that platforms govern or manage gig workers. For instance, deactivation and gamification could fall into dark patterns if the platforms do not provide guidelines and training sessions with transparent policy (Gray et al., 2021). While early research primarily focused on the technical aspects of the gig economy as a socio-technical phenomenon, it is essential to elicit the roles policies and regulations played on the technical aspects, so as to examine the impacts of policies and regulations on gig workers. This would be a necessary corrective as the social dimensions of

algorithmic management come more into view (Jarrahi et al., 2021).

Information asymmetry is another code that remains understudied; it consists of four subcodes: lack of information, information deficit, information disclosure, and the lack of an internal communications channel, and appeared in fewer than one third of the articles. One reason could be that many empirical studies are conducted with an interview approach and it is sometimes difficult for gig workers to point out the implicit information asymmetry that they experience (Rosenblat & Stark, 2016). Given the critical role of information flow in the gig economy, information science researchers are well-positioned to delve into this area, through the lens of knowledge sharing and collaborative sense-making (Ai et al., 2023). The third subcode under power asymmetry, social isolation, only mentioned in 24% of the papers, has more been studied through a psychological lens, and these papers were excluded from this SLR, so there is work to be done examining social isolation from a socio-technical perspective. As most of the studies in industrial and organizational psychology were conducted in a traditional workplace, it would be interesting to investigate job satisfaction, motivation (Pogorevici & Serobe, 2020), burnout, and well-being in the context of digital workplaces (Parent-Rocheleau & Parker, 2022), and how those issues could interact with issues of technical design (Behl, Rajagopal, et al., 2022).

The third main theme, ethical design, comprises five value-based subcodes: equality, transparency, trust, fairness, and privacy. While fairness received some attention, the other subcodes have not been extensively explored. As algorithms drive critical decisions about gig work assignment and design, human workers deserve to be treated ethically rather than being digitized on the platform (Connelly et al., 2021). Although the ethical design of algorithms has been widely discussed in different fields, including sociology, computer science (Kearns & Roth, 2019), and philosophy (Floridi et al., 2021), our findings show that the design principles were not often identified specifically for gig economy platforms. Considering the growing focus on ethical practices, further research in this area is vital for the long-term success of platform companies and the gig workforce.

5.3 | The inter-relations between socio-technical issues in the gig economy

In this section, we discuss how the socio-technical issues we extracted are interrelated. Not many articles in the corpus made connections between different socio-technical issues, but the extensive coding of this SLR showed some patterns as follows.

1. Flexibility and autonomy → algorithmic control → system resistance: Apparently, flexibility is one of the most important components in the gig economy. Gig workers reported that two attractive features of gig work are the ability to choose what to work on and when, so as to exercise autonomy by making their own decisions to engage in gig work (Zhang et al., 2022). However, this work condition presents a paradox when platforms use algorithmic management and big data analytics to exercise control over work time, place, and quality (Meijerink & Keegan, 2019). Interestingly, recent research also has begun to call into question the extent to which many gig workers actually have the flexibility and autonomy they think they have; such critical analysis invokes concepts such as platform capitalism to explain how platform companies compromise flexibility and autonomy while continuing to disseminate and reinforce the narrative (Parth & Bathini, 2021). The inter-relations between flexibility, autonomy, and algorithmic management indicates a duality of gig work (Meijerink & Bondarouk, 2023). This complex relation eventually leads to gig workers' resistance in which they use a wide range of tactics, with varying degrees of success, to actively defend their autonomy against algorithmic control, and to regain the flexibility promised to them in the first place, especially when the goals of algorithmic management are not aligned with the workers' behaviors (Jiang et al., 2021).
2. Ranking and evaluation → information asymmetry → power asymmetry: At the same time, performance management creates significant information and power asymmetries between the worker and the platform (Jarrahi et al., 2020). Although the rating system was originally designed to help build and promote trust between workers and consumers/clients, it also creates an unbalanced power dynamic between them, especially in the case of one-sided and customer-only rating systems (Lesala Khethisa et al., 2020). Platforms also create an information asymmetry when customers/clients have access to a lot of information about gig workers from ratings and reviews, while workers do not have similar access to information about customers/clients (Spitko, 2020). This asymmetry is exacerbated because workers remain unaware of how platforms make decisions regarding evaluations and rankings (Kinder et al., 2019), and that causes an unbalanced power between gig workers and platforms. Compared to the traditional workplace, information is a more important resource to workers in the digital context as they rely on

all kinds of information to complete work and be evaluated (Rosenblat & Stark, 2016). Hence, the power asymmetry caused by the information asymmetry will always exist and be difficult to mitigate when the platforms dominate all the information flow and gig workers only get to say yes to those conditions if they want to join in the gig economy.

3. Transparency → online community → knowledge sharing → digital literacy: To cope with information asymmetry, gig workers ask for more transparency, and when the platforms fail to provide adequate information, gig workers begin to develop online communities where they share their knowledge about gig work, platform governance, and algorithmic control (Schou & Bucher, 2022). This process is vital since gig workers need digital literacy to gain a better understanding of their work conditions and make sense of algorithmic management (Nash et al., 2018). Specifically, Jarrahi and Sutherland (2019) proposed the concept of "algorithmic competence," referring to the "workers' understanding of algorithms that assign and assess work conducted on gig platforms, and learning how to work with and around those algorithms" (p. 585). According to the empirical studies, most algorithmic competencies are gained through gig workers' online communities, for example, public fora and social media group chats (Seetharaman et al., 2021). This practice is especially important for newcomers, as the entry barrier for gig work is not always social, but can also be technical (Behl, Jayawardena, et al., 2022). This connection between transparency, online community, knowledge sharing, and digital literacy tells a story about how gig workers need to keep negotiating with the platforms to make a living, which hints at the mutual construction of people, information, and technology.

There are additional interrelations that can be explored among the subcodes, for example, between identity gaining and professionalism, but further analysis is beyond the scope of this review.

6 | CONCLUSION

The focus on socio-technical aspects of the gig economy research literature is useful because it improves our perceptions of the mutual shaping that occurs between the digital platforms on which the gig economy rests and the gig workers whose labor drives the gig economy. This systematic literature review reveals the significance of adopting a social informatics approach in understanding a new socio-technical phenomenon and its complexities. Three main themes, namely the nature of the digital workplace, the role of algorithmic management, and the importance of ethical design, characterize the findings in gig economy research. Identifying underexplored domains and potential areas for future research offers valuable insights for researchers and policymakers seeking to address challenges and harness the opportunities presented by the gig economy. This study has broader implications for developing a shared understanding of the socio-technical elements of the gig economy, and how it supports the gig economy's observed socio-technical phenomena. To conclude, this paper makes three main contributions. First, it foregrounds the socio-technical issues in the gig economy that have arisen in recent research in a comprehensive and explicit way. Second, it provides terminology through the codes and subcodes that can be used by other researchers interested in this topic in the future, which will help ground the common knowledge with less conceptual division. Third, the review finds that there are important socio-technical issues that have not received adequate attention, pointing to new research directions; and also the possible interrelations between those socio-technical issues could identify forces pulling in different directions and reveal the causal mechanisms.

This SLR has several limitations and there are some directions for future work. First, since the gig economy is a relatively new phenomenon, some scholars are using different terms to study this phenomenon. Because we only used "gig economy" OR "gig work" OR "gig worker(s)" as search terms, it is possible that some relevant literature was missed when researchers not using these terms in their papers are still contributing to the "gig economy" research domain. In the future, "platform economy," "sharing economy," "crowd work," or "on-demand work" could be considered to make a more exhaustive list for data collection. Second, the publication type was limited to peer-reviewed journal and conference papers. However, there are many dissertations and books focused on this new phenomenon that have been published in recent years. Future research can include these sources to gain a more nuanced understanding of trends in research. Third, as we only paid attention to socio-technical issues this time, other issues such as the economic impacts, psychological changes, legal, policy and regulatory regimes can be investigated in the future. Fourth, as noted in the discussion, a greater number of researchers have started focusing on specific socio-technical issues in their studies, for example, algorithmic management and algorithmic control. This means that each code and subcode might be used to conduct searches as well. Meanwhile, in the future, scholars could focus on the same gig economy platform in multiple

areas to conduct research for investigating more regional and cultural differences. The post-pandemic context could also bring some new changes to the gig economy as a socio-technical system, so there might be unique issues after Covid-19 pandemic that are noticeable, considering how remote work becomes a routine in many workplaces.

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REFERENCES

Ai, W., Chen, Y., Mei, Q., Ye, J., & Zhang, L. (2023). Putting teams into the gig economy: A field experiment at a ride-sharing platform. *Management Science*, *69*(9), 4973–5693. https://doi.org/10.1287/mnsc.2022.4624

Alacovska, A., Bucher, E., & Fieseler, C. (2022). A relational work perspective on the gig economy: Doing creative work on digital labour platforms. *Work, Employment and Society*, *2022*, 095001702211031. https://doi.org/10.1177/09500170221103146

Alkhatib, A., Bernstein, M. S., & Levi, M. (2017). Examining crowd work and gig work through the historical lens of piecework. In *Proceedings of the 2017 CHI conference on human factors in computing systems* (pp. 4599–4616). ACM. https://doi.org/10.1145/3025453.3025974

Almoqbel, M. Y., & Wohn, D. Y. (2019). Individual and collaborative behaviors of rideshare drivers in protecting their safety. *Proceedings of the ACM on Human-Computer Interaction*, *3*, 1–21. https://doi.org/10.1145/3359319

Altenried, M. (2022). *The digital factory*. The University of Chicago Press.

Anjali Anwar, I., Pal, J., & Hui, J. (2021). Watched, but moving: Platformization of beauty work and its gendered mechanisms of control. *Proceedings of the ACM on Human-Computer Interaction*, *4*, 1–20. https://doi.org/10.1145/3432949

Anjali Anwar, I., Thomas, M., Toyama, K., & Hui, J. (2022). Gig platforms as faux infrastructure: A case study of women beauty workers in India. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW2), 1–25. https://doi.org/10.1145/3555134

Anwar, A., Hussain, A., & Bukhari, S. A. H. (2021). Digital platform and HR professionals: A review paper. *Journal of Applied Research and Multidisciplinary Studies*, *2*(1), 1–17. https://doi.org/10.32350/jarms.21.01

Anwar, M. A., & Graham, M. (2020). Hidden transcripts of the gig economy: Labour agency and the new art of resistance among African gig workers. *Environment and Planning A: Economy and Space*, *52*(7), 1269–1291. https://doi.org/10.1177/0308518X19894584

Anwar, M. A., & Graham, M. (2021). Between a rock and a hard place: Freedom, flexibility, precarity and vulnerability in the gig economy in Africa. *Competition & Change*, *25*(2), 237–258. https://doi.org/10.1177/1024529420914473

Au-Yeung, T. C., & Qiu, J. (2022). Institutions, occupations and connectivity: The embeddedness of gig work and platform-mediated labour market in Hong Kong. *Critical Sociology*, *48*, 1169–1187. https://doi.org/10.1177/08969205221090581

Baiyere, A., Islam, A. N., & Mäntymäki, M. (2019). Duality of work in sharing economy platforms. In *AMCIS 2019 proceedings*. Association for Information Systems. AIS Electronic Library (AISeL).

Barzilay, A. R., & Ben-David, A. (2016). Platform inequality: Gender in the gig-economy. *Seton Hall Law Review*, *47*(2), 393–432.

Batmunkh, A., Fekete-Farkas, M., & Lakner, Z. (2022). Bibliometric analysis of gig economy. *Administrative Sciences*, *12*(2), 51. https://doi.org/10.3390/admsci12020051

Behl, A., Jayawardena, N., Ishizaka, A., Gupta, M., & Shankar, A. (2022). Gamification and gigification: A multidimensional theoretical approach. *Journal of Business Research*, *139*, 1378–1393. https://doi.org/10.1016/j.jbusres.2021.09.023

Behl, A., Rajagopal, K., Sheorey, P., & Mahendra, A. (2022). Barriers to entry of gig workers in the gig platforms: Exploring the dark side of the gig economy. *Aslib Journal of Information Management*, *74*(5), 818–839. https://doi.org/10.1108/AJIM-08-2021-0235

Beigi, M., Nayyeri, S., & Shirmohammadi, M. (2022). Steering wheels to make ends meet: Understanding stressors and coping strategies among app-based taxi drivers in Tehran. *Journal of Vocational Behavior*, *138*, 103782. https://doi.org/10.1016/j.jvb.2022.103782

Bellesia, F., Mattarelli, E., Bertolotti, F., & Sobrero, M. (2019). Platforms as entrepreneurial incubators? How online labor markets shape work identity. *Journal of Managerial Psychology*, *34*(4), 246–268. https://doi.org/10.1108/JMP-06-2018-0269

Bhati, P. (2021). A glance into the world of gig economy: A review & bibliometric analysis. *Towards Excellence*, *13*(4), 739–759.

Blaising, A., Askay, D., Kotturi, Y., & Kulkarni, C. (2018). A qualitative investigation of unmet information-seeking needs of online workers. In *AMCIS 2018 proceedings*. AIS eLibraray.

Blaising, A., & Dabbish, L. (2022). Managing the transition to online freelance platforms: Self-directed socialization. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW2), 1–26. https://doi.org/10.1145/3555201

Blaising, A., Kotturi, Y., Kulkarni, C., & Dabbish, L. (2021). Making it work, or not: A longitudinal study of career trajectories among online freelancers. *Proceedings of the ACM on Human-Computer Interaction*, *4*, 1–29. https://doi.org/10.1145/3432925

Blumer, H. (1986). *Symbolic interactionism: Perspective and method*. University of California Press.

Blyth, D. L., Jarrahi, M. H., Lutz, C., & Newlands, G. (2022). Self-branding strategies of online freelancers on Upwork. *New Media & Society*, *2022*, 14614448221108960. https://doi.org/10.1177/14614448221108960

Bornes, L. (2023). A methodology and a tool to support the sustainable design of interactive systems: Adapting systemic design tools to model complexity in interaction design. In *Extended abstracts of the 2023 CHI conference on human factors in computing systems* (pp. 1–5). ACM. https://doi.org/10.1145/3544549.3577055

Bucher, E. L., Schou, P. K., & Waldkirch, M. (2021). Pacifying the algorithm—Anticipatory compliance in the face of algorithmic

management in the gig economy. *Organization*, *28*(1), 44–67. https://doi.org/10.1177/1350508420961531

Buckingham, M., & Goodall, A. (2015). Reinventing performance management. *Harvard Business Review*, *93*(4), 40–50.

Busalim, A. H. (2016). Understanding social commerce: A systematic literature review and directions for further research. *International Journal of Information Management*, *36*(6), 1075–1088. https://doi.org/10.1016/j.ijinfomgt.2016.06.005

Cant, C. (2019). *Riding for Deliveroo: Resistance in the new economy*. John Wiley & Sons.

Carrera-Rivera, A., Ochoa-Agurto, W., Larrinaga, F., & Lasa, G. (2022). How-to conduct a systematic literature review: A quick guide for computer science research. *MethodsX*, *9*, 101895. https://doi.org/10.1016/j.mex.2022.101895

Cartelli, A. (2007). Socio-technical theory and knowledge construction: Towards new pedagogical paradigms? *Issues in Informing Science & Information Technology*, *4*, 1–14.

Chan, N. K. (2022). Algorithmic precarity and metric power: Managing the affective measures and customers in the gig economy. *Big Data & Society*, *9*(2), 20539517221133780. https://doi.org/10.1177/20539517221133779

Chapman, K. (2021). Characteristics of systematic reviews in the social sciences. *Journal of Academic Librarianship*, *47*(5), 102396. https://doi.org/10.1016/j.acalib.2021.102396

Chen, L., & Nath, R. (2008). A socio-technical perspective of mobile work. *Information Knowledge Systems Management*, *7*(1–2), 41–60.

Chen, Z., Lan, X., Piao, J., Zhang, Y., & Li, Y. (2022). A mixed-methods analysis of the algorithm-mediated labor of online food deliverers in China. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW2), 1–24. https://doi.org/10.1145/3555585

Cheng, M. (2016). Sharing economy: A review and agenda for future research. *International Journal of Hospitality Management*, *57*, 60–70. https://doi.org/10.1016/j.ijhm.2016.06.003

Chibanda, R., Tsibolane, P., & Nkohla-Ramunenyiwa, T. (2022). Gendered inequality on digital labour platforms in the global south: Towards a freedom-based inclusion. In Y. Zheng, P. Abbott, & J. A. Robles-Flores (Eds.), *Freedom and social inclusion in a connected world* (Vol. 657, pp. 55–68). Springer. https://doi.org/10.1007/978-3-031-19429-0_4

Chidoori, C., & van Belle, J.-P. (2020). Attitudes toward and experiences of digital labour in South Africa. In R. K. Bandi, C. R. Ranjini, S. Klein, S. Madon, & E. Monteiro (Eds.), *The future of digital work: The challenge of inequality* (pp. 102–116). Springer.

Christiaens, T. (2022). *Digital working lives: Worker autonomy and the gig economy*. Rowman & Littlefield.

Cieslik, K., Banya, R., & Vira, B. (2022). Offline contexts of online jobs: Platform drivers, decent work, and informality in Lagos, Nigeria. *Development Policy Review*, *40*(4), e12595. https://doi.org/10.1111/dpr.12595

Clarkson, G., Jacobsen, T. E., & Batcheller, A. L. (2007). Information asymmetry and information sharing. *Government Information Quarterly*, *24*(4), 827–839. https://doi.org/10.1016/j.giq.2007.08.001

Connelly, C. E., Fieseler, C., Černe, M., Giessner, S. R., & Wong, S. I. (2021). Working in the digitized economy: HRM theory & practice. *Human Resource Management Review*, *31*(1), 100762. https://doi.org/10.1016/j.hrmr.2020.100762

Crain, T. L., Brossoit, R. M., Robles-Saenz, F., & Tran, M. (2020). Fighting fatigue: A conceptual model of driver sleep in the gig economy. *Sleep Health*, *6*(3), 358–365. https://doi.org/10.1016/j.sleh.2020.02.004

Cram, W. A., Wiener, M., Tarafdar, M., & Benlian, A. (2020). Algorithmic controls and their implications for gig worker well-being and behavior. *ICIS 2020 Proceedings*, *1*, 1193.

Cram, W. A., Wiener, M., Tarafdar, M., & Benlian, A. (2022). Examining the impact of algorithmic control on Uber drivers' technostress. *Journal of Management Information Systems*, *39*(2), 426–453.

Curran, N. M. (2021). Discrimination in the gig economy: The experiences of Black online English teachers. *Language and Education*, *37*(2), 171–185.

Davis, M. C., Challenger, R., Jayewardene, D. N., & Clegg, C. W. (2014). Advancing socio-technical systems thinking: A call for bravery. *Applied Ergonomics*, *45*(2), 171–180. https://doi.org/10.1016/j.apergo.2013.02.009

de la Vega, C. A., Cecchinato, M. E., & Rooksby, J. (2021). "Why lose control?" A study of freelancers' experiences with gig economy platforms. In *Proceedings of the 2021 CHI conference on human factors in computing systems* (pp. 1–14). ACM. https://doi.org/10.1145/3411764.3445305

Den Hartog, D. N., Boselie, P., & Paauwe, J. (2004). Performance management: A model and research agenda. *Applied Psychology*, *53*(4), 556–569. https://doi.org/10.1111/j.1464-0597.2004.00188.x

Dery, K., Sebastian, I. M., & van der Meulen, N. (2017). The digital workplace is key to digital innovation. *MIS Quarterly Executive*, *16*(2), 4.

Dillahunt, T. R., Wang, X., Wheeler, E., Cheng, H. F., Hecht, B., & Zhu, H. (2017). The sharing economy in computing: A systematic literature review. *Proceedings of the ACM on Human-Computer Interaction*, *1*(CSCW), 1–26.

Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2020). Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM. *Human Resource Management Journal*, *30*(1), 114–132. https://doi.org/10.1111/1748-8583.12258

Dunn, M. (2020). Making gigs work: Digital platforms, job quality and worker motivations. *New Technology, Work and Employment*, *35*(2), 232–249. https://doi.org/10.1111/ntwe.12167

Eason, K. (2013). Afterword: The past, present and future of sociotechnical systems theory. *Applied Ergonomics*, *45*(2), 213–220. https://doi.org/10.1016/j.apergo.2013.09.017

Ens, N. (2019). Shaming, striving and partying: Normative control in platform work. *ICIS 2019 Proceedings*, *4*, 2074.

Ens, N., Stein, M.-K., & Blegind Jensen, T. (2018). Decent digital work: Technology affordances and constraints. In *Proceedings of the 39th international conference on information systems (ICIS) association for information systems*. AIS Electronic Library (AISeL). http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1165&context=icis2018

Fichman, P., Sanfilippo, M. R., & Rosenbaum, H. (2015). Social informatics evolving. *Synthesis Lectures on Information Concepts, Retrieval, and Services*, *7*(5), 1–108. https://doi.org/10.2200/S00668ED1V01Y201509ICR046

Fleitoukh, A., & Toyama, K. (2020). Are ride-sharing platforms good for Indian drivers? An investigation of taxi and auto-rickshaw drivers in Delhi. In R. K. Bandi, S. Klein, C. R.

Ranjini, S. Madon, & E. Monteiro (Eds.), *The future of digital work: The challenge of inequality* (pp. 117–131). Springer. https://doi.org/10.1007/978-3-030-64697-4_10

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R., Pagallo, U., Rossi, F., Schafer, B., & Vayena, E. (2021). An ethical framework for a good AI society: Opportunities, risks, principles, and recommendations. In *Ethics, governance, and policies in artificial intelligence* (pp. 19–39). Springer. https://doi.org/10.1007/978-3-030-81907-1_3

Foong, E., Vincent, N., Hecht, B., & Gerber, E. M. (2018). Women (still) ask for less: Gender differences in hourly rate in an online labor marketplace. *Proceedings of the ACM on Human-Computer Interaction*, *2*(CSCW), 1–21.

Fousiani, K. (2022). Power asymmetry, negotiations and conflict management in organizations. In *Organizational conflict—New insights*. IntechOpen. https://doi.org/10.5772/intechopen.9549

Fu, X., Avenyo, E., & Ghauri, P. (2021). Digital platforms and development: A survey of the literature. *Innovation and Development*, *11*(2–3), 303–321. https://doi.org/10.1080/2157930X.2021.1975361

Galière, S. (2020). When food-delivery platform workers consent to algorithmic management: A Foucauldian perspective. *New Technology, Work and Employment*, *35*(3), 357–370. https://doi.org/10.1111/ntwe.12177

Gandhi, A., Sensuse, D. I., & Sucahyo, Y. G. (2019). Knowledge sharing model for competitive ecosystem on gig economy. In *Proceedings of the 2019 international SPBPU scientific conference on innovations in digital economy* (pp. 1–7). ACM. https://doi.org/10.1145/3372177.3373088

Ghosh, A., Zaidi, M., & Ramachandran, R. (2022). Locating women workers in the platform economy in India—Old wine in a new bottle? *Gender and Development*, *30*(3), 765–784. https://doi.org/10.1080/13552074.2022.2131258

Gig Economy Data Hub. (2022). *How many gig workers are there?* Retrieved from https://www.gigeconomydata.org/basics/how-many-gig-workers-are-there

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.

Gol, E. S., Avital, M., & Stein, M.-K. (2019). Crowdwork platforms: Juxtaposing centralized and decentralized governance. In *ECIS 2019 Proceedings*. Association for Information Systems. AIS Electronic Library (AISeL).

Graham, M., Hjorth, I., & 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. https://doi.org/10.1177/1024258916687250

Gray, C. M., Santos, C., Bielova, N., Toth, M., & Clifford, D. (2021). Dark patterns and the legal requirements of consent banners: An interaction criticism perspective. In *Proceedings of the 2021 CHI conference on human factors in computing systems* (pp. 1–18). ACM. https://doi.org/10.1145/3411764.3445779

Gray, M. L., & Suri, S. (2019). *Ghost work: How to stop Silicon Valley from building a new global underclass*. Eamon Dolan Books.

Griesbach, K., Reich, A., Elliott-Negri, L., & Milkman, R. (2019). Algorithmic control in platform food delivery work. *Socius*, *5*(4), 2378023119870041. https://doi.org/10.1177/2378023119870041

Gupta, P., & Chauhan, S. (2021). Mapping intellectual structure and sustainability claims of sharing economy research—a literature review. *Sustainable Production and Consumption*, *25*, 347–362. https://doi.org/10.1016/j.spc.2020.09.006

Gupta, S. (2020). Gendered gigs: Understanding the gig economy in New Delhi from a gendered perspective. In *Proceedings of the 2020 international conference on information and communication technologies and development* (pp. 1–10). ACM. https://doi.org/10.1145/3392561.3394635

Gussek, L., & Wiesche, M. (2022). The gig economy: Workers, work and platform perspective. In *Wirtschaftsinformatik 2022 proceedings*. Association for Information Systems. AIS Electronic Library (AISeL).

Gutiérrez Crocco, F., & Atzeni, M. (2022). The effects of the pandemic on gig economy couriers in Argentina and Chile: Precarity, algorithmic control and mobilization. *International Labour Review*, *161*(3), 441–461. https://doi.org/10.1111/ilr.12376

Hannák, A., Wagner, C., Garcia, D., Mislove, A., Strohmaier, M., & Wilson, C. (2017). Bias in online freelance marketplaces: Evidence from TaskRabbit and Fiverr. In *Proceedings of the 2017 ACM conference on computer supported cooperative work and social computing* (pp. 1914–1933). ACM. https://doi.org/10.1145/2998181.2998327

Harpur, P., & Blanck, P. (2020). Gig workers with disabilities: Opportunities, challenges, and regulatory response. *Journal of Occupational Rehabilitation*, *30*(4), 511–520.

Hati, S. R. H., Balqiah, T. E., Hananto, A., & Yuliati, E. (2021). A decade of systematic literature review on Airbnb: The sharing economy from a multiple stakeholder perspective. *Heliyon*, *7*(10), e08222. https://doi.org/10.1016/j.heliyon.2021.e08222

Heeks, R. (2017). *Digital economy and digital labour terminology: Making sense of the 'Gig Economy', 'Online Labour', 'Crowd Work', 'Microwork', 'Platform Labour', Etc* (Development Informatics Working Paper No. 70). University of Manchester. https://doi.org/10.2139/ssrn.3431728

Heiland, H. (2021). Controlling space, controlling labour? Contested space in food delivery gig work. *New Technology, Work and Employment*, *36*(1), 1–16. https://doi.org/10.1111/ntwe.12183

Heinrich, K., Vu, M. A., & Vysochyna, A. (2022). Algorithms as a manager: A critical literature review of algorithm management. *ICIS 2022 Proceedings*, *9*, 1891.

Howson, K., Ustek-Spilda, F., Bertolini, A., Heeks, R., Ferrari, F., Katta, S., Cole, M., Aguera Reneses, P., Salem, N., Sutcliffe, D., Steward, S., & Graham, M. (2022). Stripping back the mask: Working conditions on digital labour platforms during the COVID-19 pandemic. *International Labour Review*, *161*(3), 413–440. https://doi.org/10.1111/ilr.12222

Huang, H. (2023). Algorithmic management in food-delivery platform economy in China. *New Technology, Work and Employment*, *38*(2), 185–205. https://doi.org/10.1111/ntwe.12228

Huang, K., Yao, J., & Yin, M. (2019). Understanding the skill provision in gig economy from a network perspective: A case study of Fiverr. *Proceedings of the ACM on Human-Computer Interaction*, *3*, 1–23.

Huang, N., Burtch, G., Hong, Y., & Pavlou, P. A. (2020). Unemployment and worker participation in the gig economy: Evidence from an online labor market. *Information Systems Research*, *31*(2), 431–448. https://doi.org/10.1287/isre.2019.0896

Huber, L., Pierce, C., & Lindtner, S. (2022). An approximation of freedom: On-demand therapy and the feminization of labor. *Proceedings of the ACM on Human-Computer Interaction*, *6*-(CSCW2), 1–26. https://doi.org/10.1145/3555166

Hulikal Muralidhar, S., Rintel, S., & Suri, S. (2022). Collaboration, invisible work, and the costs of macrotask freelancing. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW2), 1–25. https://doi.org/10.1145/3555175

Jabagi, N., Croteau, A. M., Audebrand, L., & Marsan, J. (2021). Unlocking perceived algorithmic autonomy-support: Scale development and validation. In *Proceedings of the 54th Hawaii international conference on system sciences* (pp. 6492–6501). University of Hawai'i at Mānoa.

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. https://doi.org/10.1108/JMP-06-2018-0255

Jabbari, J., Roll, S., Bufe, S., & Chun, Y. (2020). *Cut me some Slack! Slack resources and technology-mediated human capital investments in entrepreneurship*. Social Policy Institute Research.

Jack, M. (2020). The socio-spatial installed base: Ride-hailing applications, parking associations, and precarity in tuk tuk driving in Phnom Penh, Cambodia. *Information Society*, *36*(5), 252–265. https://doi.org/10.1080/01972243.2020.1805247

Jacques, J. T., & Kristensson, P. O. (2019). Crowdworker economics in the gig economy. In *Proceedings of the 2019 CHI conference on human factors in computing systems* (pp. 1–10). ACM. https://doi.org/10.1145/3290605.3300621

Janssens, M., & Zanoni, P. (2021). Making diversity research matter for social change: New conversations beyond the firm. *Organization Theory*, *2*(2), 26317877211004604. https://doi.org/10.1177/26317877211004603

Jarrahi, M. H., Newlands, G., Lee, M. K., Wolf, C. T., Kinder, E., & Sutherland, W. (2021). Algorithmic management in a work context. *Big Data & Society*, *8*(2), 20539517211020332. https://doi.org/10.1177/20539517211020332

Jarrahi, M. H., & Sutherland, W. (2019). Algorithmic management and algorithmic competencies: Understanding and appropriating algorithms in gig work. In N. Taylor, C. Christian-Lamb, M. Martin, & B. Nardi (Eds.), *Information in contemporary society* (pp. 578–589). Springer. https://doi.org/10.1007/978-3-030-15742-5_55

Jarrahi, M. H., Sutherland, W., Nelson, S. B., & Sawyer, S. (2020). Platformic management, boundary resources for gig work, and worker autonomy. *Computer Supported Cooperative Work (CSCW)*, *29*(1), 153–189. https://doi.org/10.1007/s10606-019-09368-7

Jarrett, K. (2022). *Digital labor*. John Wiley & Sons.

Jiang, J., Adam, M., & Benlian, A. (2021). Algoactivistic practices in ridesharing—A topic modeling & grounded theory approach. *ECIS 2021 Research Papers*, *1*, 1055.

Jones, P. (2021). *Work without the worker: Labour in the age of platform capitalism*. Verso.

Kapoor, K., Bigdeli, A. Z., Dwivedi, Y. K., Schroeder, A., Beltagui, A., & Baines, T. (2021). A socio-technical view of platform ecosystems: Systematic review and research agenda. *Journal of Business Research*, *128*, 94–108.

Kathuria, A., Saldanha, T., Khuntia, J., Andrade Rojas, M., Mithas, S., & Hah, H. (2021). Inferring supplier quality in the gig economy: The effectiveness of signals in freelance job markets. In *Hawaii international conference on system sciences* (pp. 6583–6592).

Kearns, M., & Roth, A. (2019). *The ethical algorithm: The science of socially aware algorithm design*. Oxford University Press.

Kinder, E., Jarrahi, M. H., & Sutherland, W. (2019). Gig platforms, tensions, alliances and ecosystems: An actor-network perspective. *Proceedings of the ACM on Human-Computer Interaction*, *3*, 1–26. https://doi.org/10.1145/3359314

Kitchenham, B. (2004). Procedures for performing systematic reviews. *Keele, UK, Keele University*, *33*(2004), 1–26.

Klein, L. (2014). What do we actually mean by "sociotechnical"? On values, boundaries and the problems of language. *Applied Ergonomics*, *45*(2), 137–142. https://doi.org/10.1016/j.apergo.2013.03.027

Kling, R. (2007). What is social informatics and why does it matter? *The Information Society*, *23*(4), 205–220. https://doi.org/10.1080/01972240701441556

Kost, D., Fieseler, C., & Wong, S. I. (2020). Boundaryless careers in the gig economy: An oxymoron? *Human Resource Management Journal*, *30*(1), 100–113. https://doi.org/10.1111/1748-8583.12265

Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, *16*(3), 1023–1042. https://doi.org/10.1007/s11365-020-00635-4

Krishna, S. (2020). Spatiotemporal (in)justice in digital platforms: An analysis of food-delivery platforms in South India. In R. K. Bandi, C. R. Ranjini, S. Klein, S. Madon, & E. Monteiro (Eds.), *The future of digital work: The challenge of inequality* (pp. 132–147). Springer. https://doi.org/10.1007/978-3-030-64697-4_11

Kwan, H. (2022). Women's solidarity, communicative space, the gig economy's social reproduction and labour process: The case of female platform drivers in China. *Critical Sociology*, *48*(7–8), 1221–1236. https://doi.org/10.1177/08969205221101451

Le Breton, C., & Galière, S. (2023). The role of organizational settings in social learning: An ethnographic focus on food-delivery platform work. *Human Relations*, *76*(7), 990–1016. https://doi.org/10.1177/00187267221081295

Le Brocq, S., Hughes, E., & Donnelly, R. (2022). Sharing in the gig economy: From equitable work relations to exploitative HRM. *Personnel Review*, *52*, 454–469. https://doi.org/10.1108/PR-04-2019-0219

Lee, M. K. (2018). Understanding perception of algorithmic decisions: Fairness, trust, and emotion in response to algorithmic management. *Big Data & Society*, *5*(1), 205395171875668. https://doi.org/10.1177/2053951718756684

Lee, M. K., Kusbit, D., Metsky, E., & Dabbish, L. (2015). Working with machines: The impact of algorithmic and data-driven management on human workers. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems* (pp. 1603–1612). ACM.

Lesala Khethisa, B., Tsibolane, P., & Van Belle, J. P. (2020). Surviving the gig economy in the global South: How Cape Town domestic workers cope. In R. K. Bandi, C. R. Ranjini, S. Klein, S. Madon, & E. Monteiro (Eds.), *The future of digital work: The challenge of inequality* (pp. 67–85). Springer. https://doi.org/10.1007/978-3-030-64697-4_7

Li, Y., Xu, S., Yu, Y., & Meadows, R. (2022). The well-being of gig workers in the sharing economy during COVID-19. *International Journal of Contemporary Hospitality Management*, *35*(4), 1470–1489. https://doi.org/10.1108/IJCHM-01-2022-0064

Liang, C., Hong, Y., & Gu, B. (2018). Home bias in online employment. In *Proceedings of the 51st Hawaii international conference on system sciences*. University of Hawai'i at Mānoa.

Linnenluecke, M. K., Marrone, M., & Singh, A. K. (2020). Conducting systematic literature reviews and bibliometric analyses. *Australian Journal of Management*, *45*(2), 175–194. https://doi.org/10.1177/0312896219877678

Lord, C., Bates, O., Friday, A., McLeod, F., Cherrett, T., Martinez-Sykora, A., & Oakey, A. (2023). The sustainability of the gig economy food delivery system (Deliveroo, UberEATS and JustEat): Histories and futures of rebound, lock-in and path dependency. *International Journal of Sustainable Transportation*, *17*(5), 490–502. https://doi.org/10.1080/15568318.2022.2066583

Lukac, M., & Grow, A. (2021). Reputation systems and recruitment in online labor markets: Insights from an agent-based model. *Journal of Computational Social Science*, *4*(1), 207–229. https://doi.org/10.1007/s42001-020-00072-x

Ma, N. F., Rivera, V. A., Yao, Z., & Yoon, D. (2022). "Brush it off": How women workers manage and cope with bias and harassment in gender-agnostic gig platforms. In *Proceedings of the 2022 CHI conference on human factors in computing systems* (pp. 1–13). ACM. https://doi.org/10.1145/3491102.3517524

Ma, N. F., Yuan, C. W., Ghafurian, M., & Hanrahan, B. V. (2018). Using stakeholder theory to examine drivers' stake in Uber. In *Proceedings of the 2018 CHI conference on human factors in computing systems* (pp. 1–12). ACM. https://doi.org/10.1145/3173574.3173657

Maffie, M. D. (2023). Becoming a pirate: Independence as an alternative to exit in the gig economy. *British Journal of Industrial Relations*, *61*(1), 46–67. https://doi.org/10.1111/bjir.12668

Mahato, M., Kumar, N., & Jena, L. K. (2021). Re-thinking gig economy in conventional workforce post-COVID-19: A blended approach for upholding fair balance. *Journal of Work-Applied Management*, *13*(2), 261–276. https://doi.org/10.1108/JWAM-05-2021-0037

Malik, R., Visvizi, A., & Skrzek-Lubasińska, M. (2021). The gig economy: Current issues, the debate, and the new avenues of research. *Sustainability*, *13*(9), 5023. https://doi.org/10.3390/su13095023

Mäntymäki, M., Baiyere, A., & Islam, A. K. M. N. (2019). Digital platforms and the changing nature of physical work: Insights from ride-hailing. *International Journal of Information Management*, *49*, 452–460. https://doi.org/10.1016/j.ijinfomgt.2019.08.007

Meijerink, J., & Bondarouk, T. (2023). The duality of algorithmic management: Toward a research agenda on HRM algorithms, autonomy and value creation. *Human Resource Management Review*, *33*(1), 100876. https://doi.org/10.1016/j.hrmr.2021.100876

Meijerink, J., & Keegan, A. (2019). Conceptualizing human resource management in the gig economy: Toward a platform ecosystem perspective. *Journal of Managerial Psychology*, *34*(4), 214–232. https://doi.org/10.1108/JMP-07-2018-0277

Meijerink, J., Keegan, A., & Bondarouk, T. (2021). Having their cake and eating it too? Online labor platforms and human resource management as a case of institutional complexity. *International Journal of Human Resource Management*, *32*(19), 4016–4052. https://doi.org/10.1080/09585192.2020.1867616

Mendonça, P., & Kougiannou, N. K. (2023). Disconnecting labour: The impact of intraplatform algorithmic changes on the labour process and workers' capacity to organise collectively. *New Technology, Work and Employment*, *38*(1), 1–20. https://doi.org/10.1111/ntwe.12251

Mendonça, P., Kougiannou, N. K., & Clark, I. (2023). Informalization in gig food delivery in the UK: The case of hyper-flexible and precarious work. *Industrial Relations*, *62*(1), 60–77. https://doi.org/10.1111/irel.12320

Mieruch, Y., & McFarlane, D. (2022). Gig economy riders on social media in Thailand: Contested identities and emergent civil society organisations. *VOLUNTAS*, *34*, 1232–1242. https://doi.org/10.1007/s11266-022-00547-7

Mpofu, T., Tsibolane, P., Heeks, R., & Van Belle, J.-P. (2020). Risks and risk-mitigation strategies of gig economy workers in the global South: The case of ride-hailing in Cape Town. In J. M. Bass & P. J. Wall (Eds.), *Information and communication technologies for development* (pp. 26–38). Springer. https://doi.org/10.1007/978-3-030-65828-1_3

Mumford, E. (2000). A socio-technical approach to systems design. *Requirements Engineering*, *5*(2), 125–133. https://doi.org/10.1007/PL00010345

Munoz, I., Dunn, M., Sawyer, S., & Michaels, E. (2022). Platform-mediated markets, online freelance workers and deconstructed identities. *Proceedings of the ACM on Human-Computer Interaction*, *6*, 1–24. https://doi.org/10.1145/3555092

Nair, G. (2022). "New" terrains of precarity—Gig work in India. *Contemporary South Asia*, *30*(3), 388–401. https://doi.org/10.1080/09584935.2022.2099813

Nash, C., Jarrahi, M. H., Sutherland, W., & Phillips, G. (2018). Digital nomads beyond the buzzword: Defining digital nomadic work and use of digital technologies. In G. Chowdhury, J. McLeod, V. Gillet, & P. Willett (Eds.), *Transforming digital worlds* (pp. 207–217). Springer. https://doi.org/10.1007/978-3-319-78105-1_25

Newlands, G. (2021). Algorithmic surveillance in the gig economy: The organization of work through Lefebvrian conceived space. *Organization Studies*, *42*(5), 719–737. https://doi.org/10.1177/0170840620937900

Newlands, G. (2022). Anthropotropism: Searching for recognition in the scandinavian gig economy. *Sociology*, *56*(5), 821–838. https://doi.org/10.1177/00380385211063362

Ngowi, L., & Mvungi, N. H. (2018). Socio-technical systems: Transforming theory into practice. *International Journal of Industrial and Systems Engineering*, *12*(2), 310–316. https://doi.org/10.5281/zenodo.1316221

Norman, D. A. (1999). Affordance, conventions, and design. *Interactions*, *6*(3), 38–43. https://doi.org/10.1145/301153.301168

Okoli, C. (2015). A guide to conducting a standalone systematic literature review. *Communications of the Association for Information Systems*, *37*(1), 43.

Panaligan, J. H., & Curran, N. M. (2022). "We are cheaper, so they hire us": Discounted nativeness in online English teaching. *Journal of SocioLinguistics*, *26*(2), 246–264. https://doi.org/10.1111/josl.12543

Parent-Rocheleau, X., & Parker, S. K. (2022). Algorithms as work designers: How algorithmic management influences the design

of jobs. *Human Resource Management Review*, *32*(3), 100838. https://doi.org/10.1016/j.hrmr.2021.100838

Parth, S., & Bathini, D. R. (2021). Microtargeting control: Explicating algorithmic control and nudges in platform-mediated cab driving in India. *New Technology, Work and Employment*, *36*(1), 74–93. https://doi.org/10.1111/ntwe.12188

Pasquale, F. (2016). Two narratives of platform capitalism. *Policy Review*, *35*, 309–319.

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.

Pittaway, L. (2011). Systematic literature reviews. In R. Thorpe & R. Holt (Eds.), *The SAGE dictionary of qualitative management research* (pp. 217–218). Sage.

Pogorevici, C., & Serobe, T. (2020). Motivating factors for workers and platforms in the South African gig economy. *Social Impact Research Experience (SIRE)*, *76*, 1–38.

Polkowska, D., & Mika, B. (2022). Is it possible to outsmart Uber? Individual working tactics within platform work in Poland. *European Societies*, *25*(4), 606–626. https://doi.org/10.1080/14616696.2022.2156578

Popan, C. (2021). Embodied precariat and digital control in the "gig economy": The mobile labor of food delivery workers. *Journal of Urban Technology*, 1–20. https://doi.org/10.1080/10630732.2021.2001714

Posada, J. (2022). Embedded reproduction in platform data work. *Information, Communication & Society*, *25*(6), 816–834. https://doi.org/10.1080/1369118X.2022.2049849

Posada, J., & Shade, L. R. (2020). Platform labour discourse: How Hyr targets the "Bucket List Generation". *Democratic Communiqué*, *29*, 1.

Prabhat, S., Nanavati, S., & Rangaswamy, N. (2019). India's "Uberwallah": Profiling Uber drivers in the gig economy. In *Proceedings of the tenth international conference on information and communication technologies and development* (pp. 1–5). ACM. https://doi.org/10.1145/3287098.3287139

Pregenzer, M., Remus, U., & Wiener, M. (2020). When market meets bureaucracy: Toward an integrative framework of technology-mediated control in the gig economy. *ECIS 2020 Proceedings*, *67*.

Pregenzer, M., Remus, U., & Wiener, M. (2021). Algorithms in the driver's seat: Explaining workers' reactions to algorithmic control. *ECIS 2021 Proceedings*, *83*, 1417.

Puram, P., Gurumurthy, A., Narmetta, M., & Mor, R. S. (2021). Last-mile challenges in on-demand food delivery during COVID-19: Understanding the riders' perspective using a grounded theory approach. *International Journal of Logistics Management*, *33*(3), 901–925. https://doi.org/10.1108/IJLM-01-2021-0024

Rachmawati, R., Safitri Zakia, L., Lupita, A., & de Ruyter, A. (2021). Urban gig workers in Indonesia during COVID-19: The experience of online "ojek" drivers. *Work Organisation, Labour & Globalisation*, *15*(1), 1. https://doi.org/10.13169/workorgalaboglob.15.1.0031

Raval, N., & Pal, J. (2019). Making a "Pro": "Professionalism" after platforms in beauty-work. *Proceedings of the ACM on Human-Computer Interaction*, *3*, 1–17. https://doi.org/10.1145/3359277

Ravenelle, A. J. (2019a). *Hustle and gig: Struggling and surviving in the sharing economy*. University of California Press.

Ravenelle, A. J. (2019b). "We're not uber:" Control, autonomy, and entrepreneurship in the gig economy. *Journal of Managerial Psychology*, *34*(4), 269–285. https://doi.org/10.1108/JMP-06-2018-0256

Riordan, T., Robinson, R. N. S., & Hoffstaedter, G. (2022). Seeking justice beyond the platform economy: Migrant workers navigating precarious lives. *Journal of Sustainable Tourism*, *31*, 2734–2751. https://doi.org/10.1080/09669582.2022.2136189

Roberts, S. T. (2019). *Behind the screen*. Yale University Press.

Rogers, B. (2023). *Data and democracy at work*. MIT Press.

Rosenblat, A. (2018). *Uberland: How algorithms are rewriting the rules of work*. University of California Press.

Rosenblat, A., & Stark, L. (2016). Algorithmic labor and information asymmetries: A case study of Uber's drivers. *International Journal of Communication*, *10*, 27. https://doi.org/10.2139/ssrn.2686227

Rubert, A. (2022). From discreet resistances to Yellow Vests protests in platform capitalism? An ethnographic survey among bicycle delivery workers. *European Journal of Cultural and Political Sociology*, *10*(1), 68–97. https://doi.org/10.1080/23254823.2022.2110510

Sahai, S., Ciby, M. A., & Kahwaji, A. T. (2020). Workplace isolation: A systematic review and synthesis. *International Journal of Management (IJM)*, *11*(12), 2745–2758. https://doi.org/10.34218/IJM.11.12.2020.257

Sannon, S., Sun, B., & Cosley, D. (2022). Privacy, surveillance, and power in the gig economy. In *Proceedings of conference on human factors in computing systems* (pp. 1–15). ACM. https://doi.org/10.1145/3491102.3502083

Schlagwein, D., Schoder, D., & Spindeldreher, K. (2020). Consolidated, systemic conceptualization, and definition of the "sharing economy". *Journal of the Association for Information Science and Technology*, *71*(7), 817–838. https://doi.org/10.1002/asi.24300

Schmidt, F. A. (2017). *Digital labour markets in the platform economy: Mapping the political challenges of crowd work and gig work* (Report). Friedrich-Ebert-Stiftung. Retrieved from https://library.fes.de/pdf-files/wiso/13164.pdf

Scholz, T. (2017). *Uberworked and underpaid: How workers are disrupting the digital economy*. John Wiley & Sons.

Scholz, T., & Schneider, N. (2016). *Ours to hack and to own: The rise of platform cooperativism, a new vision for the future of work and a fairer internet*. OR Books.

Schou, P. K., & Bucher, E. (2022). Divided we fall: The breakdown of gig worker solidarity in online communities. *New Technology, Work and Employment*, *38*, 472–492. https://doi.org/10.1111/ntwe.12260

Seetharaman, B., Pal, J., & Hui, J. (2021). Delivery work and the experience of social isolation. *Proceedings of the ACM on Human-Computer Interaction*, *5*, 1–17. https://doi.org/10.1145/3449138

Seghezzi, A., Winkenbach, M., & Mangiaracina, R. (2021). On-demand food delivery: A systematic literature review. *International Journal of Logistics Management*, *32*(4), 1334–1355. https://doi.org/10.1108/IJLM-03-2020-0150

Shapiro, A. (2018). Between autonomy and control: Strategies of arbitrage in the "on-demand" economy. *New Media & Society*, *20*(8), 2954–2971.

Shevchuk, A., & Strebkov, D. (2021). Digital platforms and the changing freelance workforce in The Russian Federation: A ten-year perspective. *International Labour Review*, *162*(1), 1–22. https://doi.org/10.1111/ilr.12232

Shevchuk, A., Strebkov, D., & Tyulyupo, A. (2021). Always on across time zones: Invisible schedules in the online gig economy. *New Technology, Work and Employment*, *36*(1), 94–113. https://doi.org/10.1111/ntwe.12191

Shin, D. (2014). A socio-technical framework for internet-of-things design: A human-centered design for the internet of things. *Telematics and Informatics*, *31*(4), 519–531. https://doi.org/10.1016/j.tele.2014.02.003

Shirolkar, S., & Patil, K. (2021). Antecedents, decisions, and outcomes of a sharing economy: A systematic literature review. *Technology Innovation Management Review*, *11*(11/12), 59–71. https://doi.org/10.22215/timreview/1474

Soden, R., Pathak, P., & Doggett, O. (2021). What we speculate about when we speculate about sustainable HCI. In *ACM SIGCAS conference on computing and sustainable societies* (pp. 188–198). ACM. https://doi.org/10.1145/3460112.3471956

Soriano, C. R. R., & Cabañes, J. V. A. (2020). Entrepreneurial solidarities: Social media collectives and Filipino digital platform workers. *Social Media + Society*, *6*(2), 2056305120926484. https://doi.org/10.1177/2056305120926484

Spitko, E. G. (2020). Reputation systems bias in the platform workplace. *BYU Law Review*, *2019*(5), 1271–1332.

Srnicek, N. (2017). *Platform capitalism*. John Wiley & Sons.

Stocker, V., Kolleck, A., Brause, S. R., & Schawe, N. (2021). Navigating the landscape of the sharing and gig economy literature: A systematic and interdisciplinary review. *SSRN Electronic Journal*, 1–42. https://doi.org/10.2139/ssrn.3773458

Sutherland, W., & Jarrahi, M. H. (2017). The gig economy and information infrastructure: The case of the digital nomad community. *Proceedings of the ACM on Human-Computer Interaction*, *1*, 1–24. https://doi.org/10.1145/3134732

Sutherland, W., & Jarrahi, M. H. (2018). The sharing economy and digital platforms: A review and research agenda. *International Journal of Information Management*, *43*, 328–341. https://doi.org/10.1016/j.ijinfomgt.2018.07.004

Sutherland, W., Jarrahi, M. H., Dunn, M., & Nelson, S. B. (2020). Work precarity and gig literacies in online freelancing. *Work, Employment and Society*, *34*(3), 457–475. https://doi.org/10.1177/0950017019886511

Tan, Z. M., Aggarwal, N., Cowls, J., Morley, J., Taddeo, M., & Floridi, L. (2021). The ethical debate about the gig economy: A review and critical analysis. *Technology in Society*, *65*, 101594. https://doi.org/10.1016/j.techsoc.2021.101594

Thebault-Spieker, J., Kluver, D., Klein, M. A., Halfaker, A., Hecht, B., Terveen, L., & Konstan, J. A. (2017). Simulation experiments on (the absence of) ratings bias in reputation systems. *Proceedings of the ACM on Human-Computer Interaction*, *1*(CSCW), 1–25.

Tironi, M., & Albornoz, C. (2022). Surveillance and the ecology of frictions in platform urbanism: The case of delivery workers in Santiago de Chile. *Tapuya: Latin American Science, Technology and Society*, *5*(1), 2123633. https://doi.org/10.1080/25729861.2022.2123633

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, *14*, 207–222. https://doi.org/10.1111/1467-8551.00375

Vallas, S., & Schor, J. B. (2020). What do platforms do? Understanding the gig economy. *Annual Review of Sociology*, *46*(1), 273–294. https://doi.org/10.1146/annurev-soc-121919-054857

Van Doorn, N., & Badger, A. (2020). Platform capitalism's hidden abode: Producing data assets in the gig economy. *Antipode*, *52*(5), 1475–1495. https://doi.org/10.1111/anti.12641

Vasudevan, K., & Chan, N. K. (2022). Gamification and work games: Examining consent and resistance among Uber drivers. *New Media & Society*, *24*(4), 866–886. https://doi.org/10.1177/14614448221079028

Vermaas, P., Kroes, P., van de Poel, I., Franssen, M., & Houkes, W. (2011). Sociotechnical systems. In *A philosophy of technology* (pp. 67–81). Springer.

Wagner, G., & Prester, J. (2019). Information systems research on digital platforms for knowledge work: A scoping review. *ICIS 2019 Proceedings*, *2*, 1322.

Waldkirch, M., Bucher, E., Schou, P. K., & Grünwald, E. (2021). Controlled by the algorithm, coached by the crowd—How HRM activities take shape on digital work platforms in the gig economy. *International Journal of Human Resource Management*, *32*(12), 2643–2682. https://doi.org/10.1080/09585192.2021.1914129

Wang, B., Schlagwein, D., Cecez-Kecmanovic, D., & Cahalane, M. (2018). Digital work and high-tech wanderers: Three theoretical framings and a research agenda for digital nomadism. *ACIS 2018 Proceedings*, *55*, 1–12. https://doi.org/10.5130/acis2018.bl

Wang, Y., Wang, H., & Xu, H. (2021). Understanding the experience and meaning of app-based food delivery from a mobility perspective. *International Journal of Hospitality Management*, *99*, 103070. doi:10.1016/j.ijhm.2021.103070

Wardhana, V. H. K., Herlina, M. G., Bangsawan, S., & Tuori, M. A. T. (2020). Regulatory developments in the gig economy: A literature review. *Winners*, *21*(2), 141–153. https://doi.org/10.21512/tw.v21i2.6758

Watkins, E. A. (2022). "Have you learned your lesson?" Communities of practice under algorithmic competition. *New Media & Society*, *24*(7), 1567–1590. https://doi.org/10.1177/14614448221099229

Watson, G. P., Kistler, L. D., Graham, B. A., & Sinclair, R. R. (2021). Looking at the gig picture: Defining gig work and explaining profile differences in gig workers' job demands and resources. *Group & Organization Management*, *46*(2), 327–361. https://doi.org/10.1177/1059601121996548

Weber, M., Remus, U., & Pregenzer, M. (2022). A new era of control: Understanding algorithmic control in the gig economy. *ICIS 2020 Proceedings*, *1*, 1190.

Wei, W., & Thomas MacDonald, I. (2022). Modeling the job quality of "work relationships" in China's gig economy. *Asia Pacific Journal of Human Resources*, *60*(4), 855–879. https://doi.org/10.1111/1744-7941.12310

Whitworth, B. (2009). A brief introduction to sociotechnical systems. In *Encyclopedia of information science and technology* (2nd ed., pp. 394–400). IGI Global.

Wiener, M., Cram, W., & Benlian, A. (2021). Algorithmic control and gig workers: A legitimacy perspective of Uber drivers. *European Journal of Information Systems*, *32*, 485–507. https://doi.org/10.1080/0960085X.2021.1977729

Wong, S. I., Kost, D., & Fieseler, C. (2021). From crafting what you do to building resilience for career commitment in the gig economy. *Human Resource Management Journal*, *31*(4), 918–935. https://doi.org/10.1111/1748-8583.12342

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019a). Good gig, bad gig: Autonomy and algorithmic control in the global gig economy. *Work, Employment and Society*, *33*(1), 56–75. https://doi.org/10.1177/0950017018785616

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019b). Networked but commodified: The (dis)embeddedness of digital labour in the gig economy. *Sociology*, *53*(5), 931–950. https://doi.org/10.1177/0038038519828906

Wood, A. J., & Lehdonvirta, V. (2022). Platforms disrupting reputation: Precarity and recognition struggles in the remote gig economy. *Sociology*, *57*, 999–1016. https://doi.org/10.1177/00380385221126804

Wood, A. J., Martindale, N., & Lehdonvirta, V. (2021). Dynamics of contention in the gig economy: Rage against the platform, customer or state? *New Technology, Work and Employment*, *38*, 330–350. https://doi.org/10.1111/ntwe.12216

Woodcock, J., & Graham, M. (2019). *The gig economy: A critical introduction*. Polity.

Woodside, J., Vinodrai, T., & Moos, M. (2021). Bottom-up strategies, platform worker power and local action: Learning from ride-hailing drivers. *Local Economy*, *36*(4), 325–343. https://doi.org/10.1177/02690942211040170

Wu, P., & Zheng, Y. (2020). Time is of the essence: Spatiotemporalities of food delivery platform work in China. *ECIS 2020 Proceedings*, *156,* 1–15.

Yang, C., Chen, Y., Zhao, X., & Cui, Z. (2022). Career identity and organizational identification among professionals with on-demand work. *Personnel Review*, *52*(3), 470–491.

Yao, Y. (2020). Uberizing the legal profession? Lawyer autonomy and status in the digital legal market. *British Journal of Industrial Relations*, *58*(3), 483–506. https://doi.org/10.1111/bjir.12485

Yoon, D., & Woo, S. S. (2020). Who is delivering my food?: Detecting food delivery abusers using variational reward inference networks. In *Proceedings of the 29th ACM international conference on information & knowledge management* (pp. 2917–2924). ACM. https://doi.org/10.1145/3340531.3412750

Zhang, A., Boltz, A., Wang, C. W., & Lee, M. K. (2022). Algorithmic management reimagined for workers and by workers: Centering worker well-being in gig work. In *Proceedings of the 2022 CHI conference on human factors in computing systems* (pp. 1–20). ACM. https://doi.org/10.1145/3491102.3501866

Zhu, J., & Marjanovic, O. (2021). A different kind of sharing economy: A literature review of platform cooperatives. In *Proceedings of the 54th Hawaii international conference on system sciences* (pp. 4128–4137). University of Hawai'i at Mānoa.

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