

The influence of technology on the future of work: Bibliometric review and directions for management scholarship

Group & Organization Management
2023, Vol. 0(0) 1–29

© The Author(s) 2023

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/10596011231212517

journals.sagepub.com/home/gom



Mahesh Subramony¹ , **Sven
Kepes², Dana Yagil³, Markus
Groth⁴, and David Solnet⁵**

Abstract

The rapid escalation of technology-driven transformation has spawned scholarship across disciplines related to the future of work. We conducted a systematic bibliometric analysis of peer-reviewed publications across multiple disciplines (business, computer science, decision science, economics, engineering, psychology, and social science) to discover how technology shapes work in the 21st century. Utilizing a variety of bibliometric techniques, we identified the dominant and influential topics in this literature. We uncovered four research clusters related to (1) algorithmic management in online platforms ($n = 297$), (2) influence of automation and new technologies on employment ($n = 121$), (3) adoption of digital technologies as a response to disruptions in the environment ($n = 68$), and (4) worker experiences and outcomes in the gig economy ($n = 47$). Based on these findings, we propose specific directions for management scholarship.

¹Northern Illinois University, DeKalb, IL, USA

²Virginia Commonwealth University, Richmond, VA, USA

³University of Haifa, Haifa, Israel

⁴UNSW, Sydney, Sydney, Australia

⁵University of Queensland, Saint Lucia, QLD, Australia

Corresponding Author:

Mahesh Subramony, Department of Management, Northern Illinois University, 245F Barsema Hall, DeKalb, IL 60115, USA.

Email: msubramony@niu.edu

Keywords

Future of work, technological change, automation, gig work, bibliometric analysis

The chance won't come again/And don't speak too soon/For the wheel's still in spin/And there's no tellin' who/That it's namin'/
The Times They Are A-Changin' – By Bob Dylan (1964)

Technological innovations have been implicated in the widespread transformation of work over several centuries (Autor et al., 2015). However, rapid developments in smart technologies, especially artificial intelligence (AI), robotics, and algorithms (Brougham & Haar, 2018), have affected the speed and scale of these changes (Parker & Grote, 2020), prompting scholars across disciplines to focus on technology-related influences on the future of work. Technology can enable the seamless delivery of service to customers (Shankar et al., 2021), increase the efficiency and accuracy of human resource management practices and processes (DiRomualdo et al., 2018), and provide workers with job flexibility (Piszczek, 2017). However, technology can also adversely affect work by normalizing precarious employment arrangements (Ashford et al., 2018; Duggan et al., 2020; Okhuysen et al., 2015), encouraging skill substitution in the realm of knowledge work (Frey & Osborne, 2017), commodifying labor (Gandini, 2019), and creating widespread job displacement (Fleming, 2017). Although these contrasting effects have been noted by management scholars (e.g., Ashford et al., 2018; Duggan et al., 2020; Spreitzer et al., 2017), there have been few attempts to systematically review and integrate interdisciplinary scholarship related to technology effects on the future of work.

Hiebl (2023) presents three criteria for systematic reviews: structured (i.e., include a clearly defined research question and contain well-explained keywords and search terms), comprehensive (i.e., review all relevant research items and literature), and transparent (i.e., contain a transparent and replicable description of methodology). Further, systematic reviews using methods such as bibliometric mapping techniques are less affected by researchers' subjective choices on what to include/exclude within a review (Zupic & Čater, 2015). This allows scholars to gain a less biased and more comprehensive, integrative understanding of the entire body of knowledge focused on a particular topic. Therefore, consistent with the call to explore the influence of technology on the future of work, including “the importance of AI, robots, co-bots in the global context of management and work ... [and] the

rise in platform workers and the affective, attitudinal and behavioral consequences of platform work” (Griep, 2022, p. 1095), we systematically analyze current scholarship related to technological influences on future-of-work literature and propose a roadmap for future scholarship.

Specifically, we use bibliometric analytic techniques to map publications related to technology and the future of work across distinct scientific disciplines. Bibliometric analysis refers to a set of quantitative techniques used for the efficient capture and interpretation of large volumes of relevant studies and the presentation of a data-driven structure of the literature (Lee et al., 2014; Ramos-Rodríguez & Ruíz-Navarro, 2004). In this study, we conduct a bibliometric analysis using bibliographic coupling enriched by data visualization to describe the key clusters of scholarship examining the relationship between technology and the future of work. In doing so, we follow precedents and recommendations of other studies in related streams of management research (e.g., Carpini et al., 2017; Parker et al., 2017) and build upon the analysis to provide scholars examining the future of work with directions for future research. As Cappelli and Keller (2013) noted, the treatment of the changing nature of work “has primarily consisted of applying theories and constructs developed in the context of traditional employment relationships. . . often without careful consideration of whether their meaning and application should remain the same in different contexts” (p. 581). Our study helps to fill this gap in the literature.

In the following sections, we provide an overview of the literature on the influence on the future of work. We describe our bibliometric analysis procedures, provide descriptive information about the literature (including the growth of publications, significant citations, and sources of these publications), map the scientific structure of the literature, and end with a discussion of the obtained results with an emphasis on future directions for research and policymakers.

Literature Overview

Technological innovations are fundamentally reshaping work through the increased use of digitization, information and communication technologies (ICTs), artificial intelligence (AI), and robotics (Ashford et al., 2018; Leopold et al., 2016). First, digitization facilitates the division of knowledge work into smaller portable tasks (Autor & Salomons, 2018) that can seamlessly be delegated for timely and cost-effective work outputs without the constraints of employment contracts (Fleming, 2017). For example, Amazon’s online platform MTurk crowdsources tasks such as software testing and the creation of training data for AI to an estimated half-million workers worldwide

(Gray & Suri, 2019). Ridesharing services allow drivers to deliver service to customers directly, bypassing the regulations governing taxi-cab services, and platforms such as Upwork connect freelancers to customers without legally binding employment contracts.

Second, ICTs continue to evolve at a rapid pace and constitute a critical infrastructure not just for individual organizations but for work ecosystems. With these technologies now available and accessible to many workers, the physical location of work and the distance between actors within a work ecosystem is becoming less relevant. Workplaces are rapidly entering a stage of ‘ubiquitous computing’ where computational technology permeates almost everything and increasingly links the physical world with digital spaces (Cascio & Montealegre, 2016). Perhaps the most salient manifestation of this virtuality is increased remote work or telecommuting. While 16.6% of the US workforce performed at least a portion of their work remotely in 2018 (US Bureau of Labor Statistics [BLS], 2020), the COVID-19 pandemic led to a three-hundred percent increase in telecommuting by mid-April 2020, with 49% of telecommuters indicating a preference for this practice (Gallup Panel, 2020). Current estimates suggest that almost half of US workers who switched to remote work due to the COVID-19 pandemic expressed a preference for continuing to work from home (Gallup Panel, 2020), and there is some evidence that some companies are considering making remote work a permanent option (PricewaterhouseCoopers, 2020).

Finally, AI and robotics have started to demonstrate the promise of complementing and replacing human contact between actors within this new emerging work ecosystem (Makridakis, 2017). Although computerization of the past focused primarily on automating routine tasks, the current innovations in AI and robotics are beginning to focus on non-routine cognitive tasks that require critical thinking, judgment, and decision-making (Frey & Osborne, 2017). Thus, previous domains of knowledge work, such as auditing, healthcare diagnostics, writing legal briefs, and language translation, are now well within the purview of AI. Similarly, using electronic kiosks and robots can potentially replace frontline service positions in several industries.

Within the management discipline, scholars have examined the forces reshaping the quality and characteristics of this changing work environment. For instance, Ashford et al. (2018) comprehensively examined gig workers’ experience of work and identified the capabilities that allow them to cope or thrive. Similarly, Spreitzer et al. (2017) provided an in-depth discussion on the changing nature of alternative work arrangements, with a focus on flexibility in employment relationships, work schedules, and the locations where work is accomplished. Others have critiqued the free-market philosophy that has led to the commoditization and individualization of labor (Fleming, 2017;

Gandini, 2019) or laid out agendas for the exploration of employment practices suitable for gig- and platform-based work (e.g., Duggan et al., 2020; Kost et al., 2018).

Our study builds upon these contributions by (a) systematically analyzing a large swath of peer-reviewed research across multiple disciplines – not just management – thereby providing breadth and comprehensiveness and (b) focusing only on technology effects, as opposed to broader discussions on changes in employment norms or capitalism, across these disciplines. The benefits of this focused and comprehensive approach include the provision of an in-depth understanding of one key force in the transformation of the world of work. Further, we provide directions for future scholarship and policy development. Next, we describe our methodological approach.

Methodology

Step 1: Following best practice recommendations for the analyses of bibliometric data (Donthu et al., 2021), we mapped the scholarly literature using VOSviewer (Van Eck & Waltman, 2010) and the R package *bibliometrix* (Aria & Cuccurullo, 2017). We searched the Scopus database for all relevant peer-reviewed articles (including empirical articles, reviews, and early-access) published between 2000 and 2023 related to the influence of various work-related technologies on the future of work using the following keywords in the article titles and/or abstracts with the OR command: “changing nature of work,” “future of work,” “future of employment,” “gig economy”; AND “technology”. Given our interest in obtaining a comprehensive understanding of the research in this domain, we searched for articles in the following disciplines: business, computer science, decision science, economics, engineering, humanities, psychology, and social science. Our search resulted in 481 peer-reviewed articles.

Step 2: We expanded the above search using author-supplied keywords – other than the ones used in Step 1 – that most frequently occurred in the peer-reviewed articles identified above. Specifically, we conducted a new search with the following keywords (numbers within the parentheses represent the frequency of the occurrence of these keywords in step 1): “automation” ($n = 60$), “artificial intelligence” ($n = 51$), “technological change” ($n = 23$), “digital*” ($n = 28$), “robot*” ($n = 14$), “machine learning” ($n = 10$), “algorithm*” ($n = 9$), “platform*” ($n = 21$) using the OR command AND [“changing nature of work” OR “future of work” OR “future of employment” OR “gig economy”]. This search yielded 686 peer-reviewed articles in

the disciplines of business, computer science, decision science, economics, engineering, humanities, psychology, and social science. After reviewing each of these articles, we eliminated those that narrowly explored specific topics (e.g., computer software, tax laws, student online learning) and arrived at a combined sample of 552 articles.

Step 3: We reviewed the abstracts of all published articles in the Scopus database in the disciplines of business and psychology with the keywords “changing nature of work” OR “future of work” OR “future of employment” and identified an additional 23 articles that were relevant to our topic. Thus, the final sample of articles selected for use in our bibliometric analysis was $N = 575$ (see [Online Materials](#)).

Step 4: Essential information regarding the 575 articles (e.g., author names, publication date, publication name, article title, abstracts, keywords, and reference lists) was loaded into the *bibliometrix* package ([Aria & Cuccurullo, 2017](#)) as well as VOSviewer ([Van Eck & Waltman, 2010](#)). As an initial step in our analysis, we examined the most important citations and sources (journals) examining technology effects on the future of work, charted the growth in published research over time, and identified trending topics in this research area.

Step 5: In the final step, we conducted science mapping with a focus on the *bibliographic coupling* of citations (overlaps in shared references between all combinations of articles in the dataset). Bibliographic coupling is a distance-based approach that measures the strength of relationships between every pair of publications in the dataset by examining the extent to which their references overlap with each other; the greater the shared references between any two articles, the stronger their association strength ([Van Eck & Waltman, 2014](#)). Clusters of articles characterized by mutual association (i.e., shared references) systematically emerge from this process, and VOSviewer’s algorithm maximizes the sum of the association strengths of articles belonging to the same cluster while minimizing the size of the clusters to reflect an internally coherent set (or clusters) of studies. The key output of this analysis is a bibliometric map that provides a visual representation of these clusters.

Results

Descriptive Analysis

Research related to technology and the future of work has accelerated over the past decade. Specifically, while 28 articles were published in this domain from 2002 to 2017, the cumulative output of articles in the five-year period of

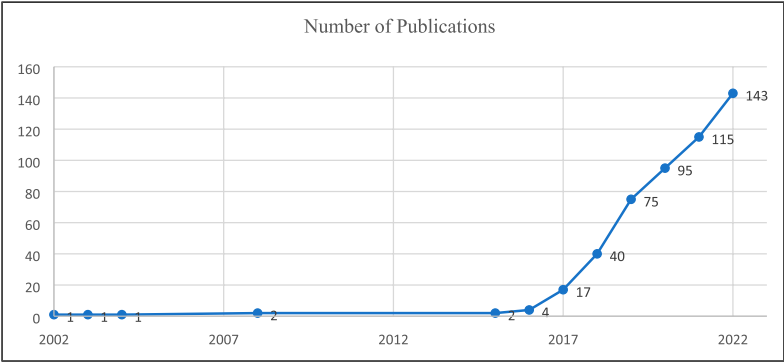


Figure 1. Annual production of peer reviewed articles related to technology and the future of work (2002 – 2022).

2018–2022 was 468 – constituting a sixteen-fold increase (Figure 1). An additional 79 articles were published in the first 6-month of the year 2023 alone. An examination of the top 10 journals publishing peer-reviewed articles related to technology and the future of work reveals a multidisciplinary emphasis (Figure 2) with a significant presence of interdisciplinary journals such as *Proceedings of the ACM on Human-Computer Interaction*; *New Technology, Work, and Employment* and *Work, Employment, and Society*. Besides these interdisciplinary sources, journals within the disciplines of human resource management (HRM; e.g., *International Journal of Human Resource Management*) and industrial relations (*Journal of Industrial Relations*, *International Labor Review*) publish the bulk of the research in this domain. The list of journals sourcing articles cited by technology and future-of-work scholars is a balanced blend of multidisciplinary (albeit with a sociology/social science emphasis) and management journals, with minimal contribution from the field of computer science. Thus, it is possible to conclude that the technology and the future-of-work literature has a multidisciplinary flavor rooted in the social science and management literature.

Bibliometric Mapping

Consistent with the purpose of this paper, we generated a bibliographic coupling map to visually represent the clusters of articles linked together by their shared references. The distance between any two articles indicates the strength of the bibliographic coupling link between these two items; that is, the closer two journal articles are located to each other, the higher the proportion

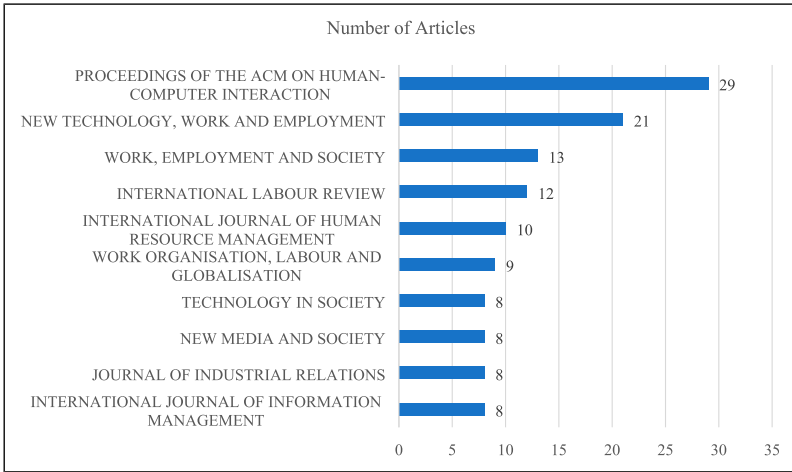


Figure 2. Peer reviewed journals publishing articles related to technology and the future of work (top 10).

of shared references (Van Eck et al., 2010). The size of each article (node) indicates the number of times a given article was referenced. The reference lists for 42 articles in our database did not overlap with the others, mostly because they were editorials with few or no references and were automatically excluded from the bibliometric coupling analysis, leaving us with a total of 533 articles for this analysis (see Table 1). Results of the bibliographic coupling analysis indicate that there are four clusters reflecting the articles in our bibliometric dataset (Figure 3). We carefully read through the documents included in each cluster and determined respective themes: (1) Algorithmic management in online platforms ($n = 297$), (2) Influence of automation and new technologies on employment ($n = 121$), (3) Adoption of digital technologies as a response to disruptions in the environment ($n = 68$), and (4) Worker experiences and outcomes in the gig economy ($n = 47$). We describe each cluster below with a focus on the articles that were most often cited and then identify gaps and opportunities for future research.

Cluster 1: Algorithmic Management in Online Platforms (N = 297)

Advancements in digitization and algorithms have fostered the creation of platform-mediated gig work wherein, instead of establishing a long-term relationship with one employer, workers engage in short-term exchanges with customers mediated by online platforms. The 297 articles in this cluster

Table 1. Clusters, Keywords, and Sample Sources.

Cluster Title	Keywords	Sample Articles	Sample Journals
Algorithmic management in online platforms (n = 297)	Gig workers, labor, algorithmic management, digital platforms	Duggan et al. (2020); Gandini (2019); Graham et al. (2017); Veen et al. (2020); Wood et al. (2019a, 2019b)	<i>Human Resource Management Journal</i> ; <i>Work, Employment and Society</i> ; <i>New Technology, Work and Employment</i>
Influence of automation and new technologies on employment (n = 121)	Automation, technology, technological change, workplace	Caruso (2018); Coombs (2020); Frey and Osborne (2017); Shestakofsky (2017); Spencer (2018)	<i>AI and Society</i> ; <i>European Economic Review</i> ; <i>Technological Forecasting and Social Change</i>
Adoption of digital technologies as a response to disruptions in the environment (n = 68)	COVID-19, pandemic, virtual teams, telecommuting	Amankwah-Amoah et al. (2021); Baptista et al. (2020); De et al. (2020); Harney and Collings (2021); Ostrom et al. (2021); Rudolph et al. (2021)	<i>Human Resource Management</i> ; <i>Industrial and Organizational Psychology</i> ; <i>International Journal of Information Management</i> ; <i>Journal of Service Research</i>
Worker experiences and outcomes in the gig economy (n = 47)	Sharing economy, entrepreneurs, online platforms, gig economy	Burtch et al. (2018); Dillahunt et al. (2017); Goods et al. (2019); Guda and Subramanian (2019); Zwick (2018)	<i>Management Science</i> ; <i>Journal of Business Ethics</i> ; <i>Proceedings of the ACM on Human-Computer Interaction</i>

describe the characteristics of online platform mediated gig work and the experiences of gig workers. The literature recognizes three different types of online platforms, depending on the work they mediate (e.g., Duggan et al., 2020): app-work (e.g., Uber), crowd-work (e.g., Amazon's MTurk), and capital platform work (e.g., Airbnb). The different types of platforms use algorithmic management, self-learning autonomous algorithms, to make

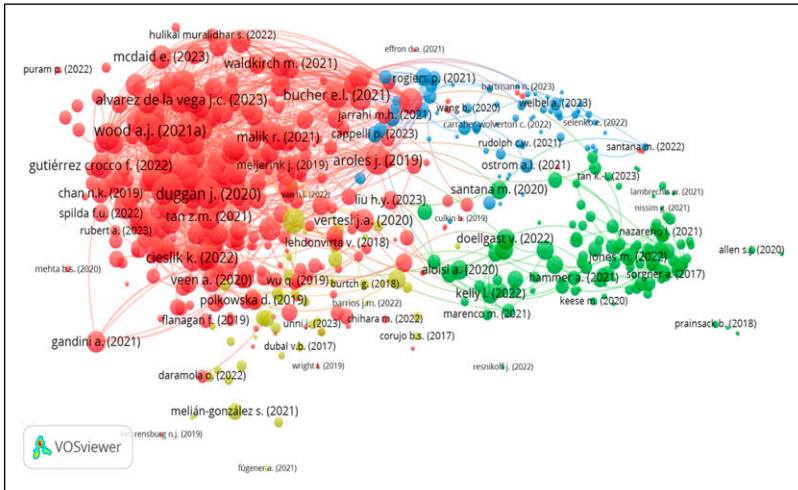


Figure 3. Bibliographic coupling map: Shared references across articles.

decisions regarding allocating tasks and managing their workers (Duggan et al., 2020). Hence, online platforms limit the degree of managerial involvement in virtually all people management aspects, which, naturally, affects the nature of work and the workers completing it.

Focusing on app work, Duggan et al. (2020) reviewed how algorithmic management performs key HRM functions, including recruitment and selection, task assignments, performance evaluations, and compensation. Although app-work platforms such as Uber provide considerable flexibility to their workers, particularly regarding their work schedules, Duggan et al. concluded that they only offer the illusion of autonomy. Indeed, online platforms control their workers through algorithmic management, particularly the constant monitoring and the automated HRM-related decision-making, including punishing workers for not accepting tasks or for not working during periods of high demand (see also Flanagan, 2019). Using labor process theory as their guiding framework (see also Gandini, 2019), Veen et al. (2020) examined how two food delivery platforms in Australia manage their workers and how the latter are responding. The authors found that both platforms use algorithmic management to intentionally create information asymmetries between them and their workers to constrain worker choice and employ obfuscated performance management systems to assess worker performance.

Lehdonvirta (2018) studied how the algorithmic management of crowd-work platforms (e.g., MTurk, MobileWorks, CloudFactory) affect gig

workers. They found that structural constraints (the availability of work and the degree to which workers depend on it) and cultural-cognitive (procrastination and presenteeism) constraints limit the extent to which workers control their schedules. Thus, just as in the context of app-work, the algorithms used by crowd-work platforms may provide an illusion of autonomy instead of actual autonomy. Several other studies have examined this duality (e.g., [Anwar & Graham, 2021](#); [Graham et al., 2017](#); [Jarrahi et al., 2020](#); [Newlands, 2021](#); [Wood et al., 2019b](#)) and generally affirm the paradoxical qualities of algorithmic management. Specifically, while algorithmic management can provide new work opportunities (i.e., ‘gigs’) and high levels of independence, flexibility, and task variety, it can also increase risks and costs such as low pay, high levels of social isolation (e.g., working alone and during irregular hours), and the psychological costs of continuous surveillance. Focusing on algorithmic surveillance, [Van Doorn and Badger \(2020\)](#) argued that digital data is a new asset class collected, controlled, and leveraged by online platforms, which hinders the creation of worker power in increasingly data-driven economies. That may be partly why [Flanagan \(2019\)](#) compared today’s gig workers to domestic servants from the 19th and 20th centuries.

Therefore, not surprisingly, several studies in this cluster discuss practices to overcome the constraints imposed by online platforms. [Graham et al. \(2017\)](#), for instance, discussed four broad strategies that may improve the working conditions and lives of workers: certification schemes, organizing workers, regulatory strategies, and democratic control of the platform. Similarly, [Lehdonvirta \(2018\)](#) offered informal practices and tools to address the potentially precarious situation of workers. The importance of strategies and tactics to overcome the constraints imposed by online platforms to create solidarity among gig workers so that they can take collective action may be among the most discussed issues in this cluster (e.g., [Howcroft & Bergvall-Kåreborn, 2019](#); [Tassinari & Maccarrone, 2020](#); [Wood et al., 2019a](#)). Other studies focused on the agency exercised by workers to reclaim some of their lost power through resilience and resistance (e.g., trying to influence the order allocation process manipulating GPS data, [Veen et al., 2020](#)).

Most studies within this cluster are case studies and not anchored in theoretical foundations. Therefore, we urge future researchers to conduct theory-driven empirical research, especially testing theoretically derived hypotheses. As one example of this, in a sample of MTurk workers, [Brawley and Pury \(2016\)](#) found that job design factors (e.g., variables from the job characteristics model; [Hackman & Oldham, 1974](#)) that influenced the job satisfaction of workers in traditional employment relationships had a weaker influence on the job satisfaction of gig workers. Thus, there could be

somewhat different psychological dynamics at play for gig workers when compared to more traditional employees.

Similarly, there could be important differences in the effects between the different types of online platforms (i.e., app-work, crowd-work, and capital platform) and even between particular platforms within one type. For instance, gig workers for capital platform apps like Airbnb could be in a different financial situation when compared to app-work workers such as food delivery drivers. Consequently, they may not be in the same precarious financial situation and do not face the same work-life balance issues. Likewise, gig workers performing crowd-work at MTurk and Fiverr tend to conduct vastly different tasks with distinct levels of autonomy and control. Currently, such potential differences are not rigorously explored in the literature. Further, as algorithm-based tools are spreading to more traditional work settings (e.g., [Jarrahi et al., 2020](#)), future research should examine the moderating effects of various traditional versus online platform related systems/procedures on the relationships between various job-design features and gig-worker outcomes.

Cluster 2: Influence of Automation and New Technologies on Employment (N = 121)

The articles in this cluster highlight the ongoing debate of how, and to what extent, the advances in new digital and robotic technologies are thought to bring about fundamental changes to the nature of work, potentially resulting in a future of less work and making some work disappear altogether. While some scholars within this research cluster predicted that these new technologies will increasingly replace the human element of production, other scholars argued that although technologies will supplant some workers, they are likely to give rise to new complementarities between human labor and the emerging technologies ([Shestakofsky, 2017](#)). For example, [Frey and Osborne \(2017\)](#) quantitatively rated the susceptibility of jobs to computerization, elucidating the distinct hurdles that engineers must surmount to enable the automation of specific vocations. By delineating these obstacles, gauging their intricacy, and assessing their relevance to distinct jobs, the authors categorized occupations based on their vulnerability to automatization. Their analysis estimated that almost half of the total employment in the United States faces a heightened risk of automatization. These findings have also been validated by others (e.g., [Gekara & Thanh Nguyen, 2018](#)). Still, others have noted the depression in wages because of automation. For instance, [Berger et al. \(2018\)](#) concluded that the emergence of Uber has reduced earnings for incumbent taxi drivers. Other studies have taken a more optimistic approach to automation and other

emerging technologies. For instance, [Ernst et al. \(2019\)](#) contends that the advent of these emerging technologies presents noteworthy prospects, particularly in terms of potential productivity gains. These gains could prove advantageous even for developing nations, owing to the considerably diminished capital costs by certain applications, coupled with the prospect of heightened productivity, especially among a less skilled workforce.

Similarly, [Willcocks \(2020\)](#) questioned many assumptions within the literature predicting the negative impact of automation and technology on work. Specifically, she suggested that a major omission in all studies predicting a gloomy outlook of the future of work is assuming dramatic increases in the amount of work to be done and that in the future, there might be too much, rather than too little, work due to an aging population and skill-shortages in most developed countries. [Spencer \(2018\)](#) similarly suggested that work will likely persist rather than disappear due to the wider use of new technology. The threat to workers from technology is thus seen to arise from the erosion in the quality of work rather than from the loss of work.

In sum, the debate about the gains and perils of the impact of automation and emerging technologies continues within this research cluster. Further, it has been amplified by the COVID-19 pandemic and the urgent need for research into the effects of these new technologies on work and its environment ([Coombs, 2020](#)). The debate is also reflected in [Santana and Cobo's \(2020\)](#) bibliographic study on the future of work that identified wage inequality, telework, talent management, satisfaction, careers, employment, and innovation as the most important themes within this literature, suggesting a tight link between technological and psychological processes. Interestingly, while much of the debate has been at the conceptual level, [Lent \(2018\)](#) suggested some very specific and concrete steps that can be taken by career development experts, both individually and collectively, to meet these challenges. These steps encompass championing the causes of displaced employees, engaging in conversations aimed at reforming educational establishments, and expanding the scope of counseling interventions to equip individuals for a potentially less secure career landscape, which is becoming increasingly prevalent for a growing portion of the workforce. Future research is needed to explore how employees and organizations can better prepare, individually and collectively, for emerging changes that will undoubtedly continue at an increasing pace.

Topics requiring future research attention include human-skill complementarity to better understand the nuanced ways in which emerging technologies can enhance and complement human skills. Research should explore the potential for skills upgrading and the development of hybrid roles that leverage both technological capabilities and uniquely human attributes,

shedding light on the evolution of job profiles and the resulting implications for the workforce (Ernst et al., 2019). Similarly, research is needed on how automation and new technologies influence workloads, job satisfaction, well-being, and overall job quality. Although much of the literature focuses on changes to the quantity of work, more research is warranted to delve into the qualitative aspects of work resulting from changes due to automation and technological change.

Cluster 3: Adoption of Digital Technologies as a Response to Disruptions in the Environment (N = 68)

This cluster contains articles across disciplines that explore the implications of environmental disruptions – specifically the COVID-19 pandemic – on technology adoption in the (mostly virtual) workplace. For instance, in the information systems discipline, De et al. (2020) identified the need for updates in technological infrastructures to permit seamless and secure virtual work, an increased focus on understanding and mitigating technostress, accessible and affordable internet connections, and scholarship on the ethics of digital surveillance, among others. Paralleling some of these concerns in the field of industrial-organizational psychology, Rudolph et al. (2021) identified ten topics that ought to form a focus for researchers in the (post-pandemic world of work. These include, for instance, work-family balance, the benefits and costs of telecommuting, the challenges of building effective virtual teams, and the need for flexible HRM policies to manage a virtual workforce. Similarly, in the interdisciplinary domain of service work, Ostrom et al. (2021) highlighted the acceleration of technological investments in the workplace – specifically the use of AI, robots, and self-serve touchpoints as a result of environmental disruptions – and discussed the potential implications of the resultant changes on the experience of employees. They point to the emergence of AM eliminating the need for human supervisors, reduced face-to-face interactions between peers in the virtual workplace, and a heightening of transactional ‘gig’ contracts as opposed to long-term employee-organization relationships. The consequences of these changes include loneliness and professional isolation, technostress, and job insecurity experienced by workers. Reflected here and elsewhere in this cluster (e.g., Amankwah-Amoah et al., 2021; Wang et al., 2020) is the concern that technologies can serve as a double-edged sword that delivers work-flexibility and work-life balance on the one hand; and precarity, loss of privacy, and isolation on the other.

Some scholars (e.g., Harney & Collings, 2021; Rudolph et al., 2021) have also argued that external influences on organizational practices have been

discounted until now and that the pandemic has highlighted the importance of revisiting and understanding the boundary conditions of key concepts (e.g., practices forming high-performance work systems, the viability of relational employment contracts, and the emergence of organizational cultures and climates). As suggested by event systems theory (Morgeson et al., 2015), novel, critical, and disruptive events (such as the pandemic) can create major cascading effects that change the nature of predictors (i.e., some variables become more salient than others) and relationships between predictors and outcomes (e.g., weakening, strengthening, or rendering these null). For instance, it is typically assumed that employees need to be physically present within the same workplace and interact with each other for shared perceptions (i.e., climate) and attitudes to emerge. Events such as pandemics can disrupt these interactions for significant periods of time, leading to the weakening of the ‘glue’ that allows collective perceptions and attitudes to emerge.

In the context of virtual work and limited interactions, future research should thus explore how online platforms and employers can build strong climates and/or cultures. The role of leaders in the new digital environment is also in need of examination, as is the role that a lack of privacy plays in employee perceptions of trust and fairness. Given that homes have become workplaces, could family members now be also considered co-workers? How should human resource practices change to handle algorithmic control and the infusion of AI and robots in the workplace? Issues such as these need to occupy the attention of scholars interested in the influence of technology and the future of work, as environmental disruptions can speed up the infusion of technology in all aspects of our work lives.

Cluster 4: Worker Experiences and Outcomes in the Gig Economy (N = 47)

This cluster includes articles that define and review core elements of platform-mediated gig work, entrepreneurialism and critiques of the influence of neoliberalism on platforms and worker exploitation. A collection of the articles in this cluster sought to improve understanding of the gig economy and how the growing use of online platforms and associated work has evolved. For example, Sutherland and Jahhari (2018) reviewed the literature and proposed a platform centralization/decentralization perspective as an effective organizing principle for diverse perspectives adopted by scholars to evaluate the impacts of technology on the gig economy. Similarly, Davies et al. (2017) proposed new terminologies to understand and more accurately research and assess gig economies, arguing the need for further attention, especially to the

etymology of gigs and gig economies, the diverse range of geographies and contexts to which gig economies contribute; defining the terms labor, work, and employment in gig economies; the role of governance and regulation in shaping the growth in gig economies, and a broader appraisal of the impact of online platforms in the gig economy.

Another grouping of articles in this cluster addresses elements of entrepreneurial activity. For example, [Ahsan \(2020\)](#) critically appraised the way online platforms celebrate gig work, disguise gigs as “micro-entrepreneurship”, and shift the risk of maintaining financial solvency to the workers (and away from the ‘employer’). Another salient subtheme in the cluster includes critiques of the impact of gig work on work quality and conditions. For example, [Goods et al. \(2019\)](#) adopted a multi-dimensional framework to draw on food-delivery workers’ accounts of economic security, autonomy, and enjoyment, arguing that both objective and workers’ subjective understandings of work need to be understood in the context of ‘fit’ with individual circumstances, work alternatives, and sociopolitical context. Their study of gig work highlighted the growing income uncertainty and challenging working conditions for many of these workers. One notable theme evident from the voices of gig workers in their study was the tension between positive elements of the work and its direct negative consequences (cycling for food deliveries provides exercise but leads to severe fatigue and being placed in precious traffic danger). They concluded that while individual circumstances make some of these jobs acceptable, the nature of many of these workers (who are often young, temporary migrants with limited English skills) has the capacity to downgrade job quality and create a self-fulfilling cycle of low pay, low security, and precarious work.

Arguing against the gig economy as a positive new world order of work, [Zwick \(2018\)](#) undertook a case study investigating how large gig platforms adopt neo-liberal abuses by misclassifying workers, engaging in what is known as ‘regime shopping’ (only engaging in markets with favorable regulations and demographic), and employing the most economically vulnerable. Similarly, [Ravenelle \(2017\)](#) explored the lived experience of gig workers and found that most did not self-identify as part of a new social movement or positive transformation of work as espoused by many online platforms. Instead, findings suggest that the platform apps are more a way to make money rather than a novel entry into business ownership.

There are myriad opportunities for further research in this cluster, focused on ways to understand and mitigate tensions between stakeholders about the value and use of gig work, balancing large multi-national firms that espouse the benefits of creating a new class of micro-entrepreneurs with contrasting concerns and perceptions that platform-mediated work negatively impacts

most workers through reduced job security, benefits and career advancement. Research is needed to enhance knowledge about how trust between gig workers and the platform can be enhanced. This can lead to testing relationships between worker perceptions of platform goodwill and dependent variables such as engagement, retention, and loyalty. In addition, more research is needed to improve the understanding and practice of regulations and policy settings across global boundaries. Researchers can support the development of improved practices and regulations to facilitate a greater common good from the continued rise of the gig economy.

Discussion

We systematically reviewed the academic literature linking technology to the future of work using bibliometric techniques, thereby providing a descriptive analysis of this literature. We used science mapping to describe the literature's key characteristics, including the main and emerging topics, the relations between them, and the relations between citing articles. Overall, our analyses indicate a steep increase in technology-related research related to the future-of-work across disciplines, focusing on both the strategic and human implications of the technology-driven transformation of work. Further, through bibliometric coupling analyses, we identified four key areas of interest among future-of-work researchers. The first cluster of research investigates worker experiences of online platform-mediated gig work, highlighting the paradox inherent in algorithmic management, which offers new work opportunities, independence, flexibility, and task richness but also involves extensive control of work structure and content, low pay, and social isolation. The second cluster consists of articles discussing the influence of automation and new technologies on employment. The articles in this cluster reflect the debate regarding the impact of technological advances on changes to the nature of work. One group of researchers suggests that these new technologies potentially result in a future of less work and the disappearance of some occupations altogether (e.g., logistics occupations) due to the replacement of workers by technology. By contrast, other scholars focusing on the advantages of automation and new technologies discuss the potential for heightened productivity among a less skilled workforce and the future increase in the required work.

Research in the third cluster discusses the adoption of digital technologies as a response to environmental disruptions, mainly focusing on the implications of the COVID-19 pandemic on technology adoption reflected in the virtual workplace. Scholars discussed the mix of advantages (e.g., allowing flexibility) and disadvantages (e.g., increased social isolation) relating to the

use of technology at times of disruption. Articles in this cluster also addressed the need to reframe workplace concepts (e.g., climate, teams) following technologies that fundamentally change the workplace (e.g., increased work from home) during times of disruption. The fourth cluster consists of three main subthemes. One group of articles defined and reviewed core elements of platform-mediated gig work (e.g., centralization/decentralization); the second group explored the relations of gig economy platforms with entrepreneurship. Lastly, some research criticized the effect of platform-induced gig work on work quality and work conditions, especially regarding characteristics such as income uncertainty and burnout.

Directions for Future Research

Our systematic review of the literature reveals related seemingly contradictory elements characterizing the effects of technology on the future of work. Technology implementation can have beneficial and detrimental consequences for workers, and one can only be fully understood by acknowledging the other. For instance, work automation increases productivity while also promoting the disappearance of many occupations. Similarly, platforms like Uber and Amazon MTurk facilitate the process of finding short-term assignments (i.e., gigs) and matching customer demands with labor supply while also levying algorithmic control over workers and creating pressures to find and continuously complete tasks. Understanding these conflicting pulls toward efficiency and opportunity, on the one hand, and disruption and ill-being, on the other hand, allows us to develop informed scholarship that can help investigate these contradictory influences of technology on the future of work. We specifically view six domains as rich for potential research and policy discussions.

Understanding and Managing Workers' Experiences of Online Platforms. Along with the benefits of independence and flexibility, gig work typically involves low pay, high levels of social isolation, working during irregular hours, and the psychological consequences of being constantly monitored and surveilled. (e.g., [Anwar & Graham, 2021](#); [Graham et al., 2017](#); [Jarrahi et al., 2020](#); [Newlands, 2021](#); [Wood et al., 2019b](#)). Online platforms control their workers through constant monitoring and AM-based HRM activities, such as punishing workers for not accepting tasks or for not working during periods of high demand ([Duggan et al., 2020](#); [Flanagan, 2019](#)). We view workers' experiences of these competing pulls between self-scheduled work on one hand and stress on the other hand as critical for empirical exploration. A better understanding of these dynamics is needed to minimize the negative effects

and explore pathways for the remediation of the negative effects. Research should also explore the effects of gig workers' framing of these aspects of their jobs as either challenges or threats (Lazarus & Folkman, 1984). Gig workers' views regarding available resources to cope with the demands of their job (e.g., knowledge, initiative, social network, and efficient time management strategies) might determine the impact of the contradictory job characteristics of autonomy and control on their well-being. As part of these types of endeavors, differences between the different types of online platforms and platforms of the same type should be explored.

Selectively Utilizing the Blend of Technology and Human Touch. Although adopting technology can improve process efficiency, it also creates the specter of job insecurity for workers and reduces the human element of frontline interactions for customers (Frey & Osborne, 2017). One way to manage this paradox is by understanding how to blend the different contributions of workers and technology. Bowen (2016) described four key roles of frontline service workers in technology-infused workplaces: enablers (who facilitate the interaction between customers and technology and solve technology-related service failures), coordinators (who bring together the different network partners in a complex service system), innovators (who understand customer needs and provide creative/customized service), and differentiators (who provide a human touch that cannot be substituted by technology). Acknowledging these four roles allows for a holistic approach toward managing the conflict between technology adoption and worker usage – leveraging a mix of both, as appropriate to the context. Adaptation to technology-infused service delivery might also be facilitated by gradually introducing and socializing employees and customers to different stages of technological complexity while continuously monitoring progress and deficiencies at each stage of adoption. A systematic approach that considers the technological complexity and required skills, as well as privacy, control, and other design issues, can increase technology acceptance (Makarius et al., 2020).

Exploring the Impact of Technologies for Working Remotely. COVID-19 has changed the workplace in numerous ways, with technology having a significant role in these changes, allowing and legitimizing working remotely. Our review indicates that classic workplace concepts such as leadership, climate, and teams have acquired different meanings when many workplace encounters are conducted virtually (e.g., Harney et al., 2021). Research is required to identify the manifestations and dynamics of concepts defined decades ago based on traditional work designs. For example, the impact of leaders is based, among other things, on employee impressions regarding the

leader's values, personality, and behaviors, which are accumulated during many formal and informal encounters with the leader (Fields, 2007). Research is needed to understand how interactions with leaders exclusively or mainly through remote work technologies affect followers' impressions of the leader or reshape the evolving roles of leaders in technology-infused workplaces.

The long-term aftermath of technology-enabled remote work is another interesting research path. Currently, many organizations (including Amazon, Apple, and even Zoom) are attempting to convince employees to attend the workplace physically, at least on some workdays. In contrast, many employees prefer to continue working from home. The availability of convenient remote work technologies and the long period of work with such technologies present significant barriers to the success of organizational "back to office" campaigns. Furthermore, the increasing phenomenon of digital nomads (Richter & Richter, 2020) and the use of digitalization in many non-work areas (e.g., internet shopping, telehealth) might contribute to employees' sense that remote work should be the default. Research should identify the effectiveness of various "back to office" management strategies and the impact of work arrangements (e.g., full-time in the office, full-time from home, and various hybrid arrangements) on employee outcomes, such as engagement and performance.

Identifying Technology-Related Emergence and Resilience of Occupations. Several scholars in the literature suggested that technology is associated with the disappearance of occupations (e.g., Frey & Osborne, 2017). Contrary to this deterministic approach, other scholars suggested that introducing a new technology elicits work behaviors designed to assimilate the technology while preserving the need for the endangered profession. For example, Nelson and Irwin (2014) describe how librarians gradually adopted and built on internet search methods to maintain their professional relevance. To elaborate our understanding of technology-related occupational resilience, research is needed to identify and integrate practices used by employees in occupations threatened by new technologies.

Other research discussed the positive aspects of technology, such as contributing to the increased amount of required work (e.g., Willcocks, 2020). Such an effect might occur when a new technology is adopted widely enough to require support, leading to the rise of a new occupational group to meet the needs of users of the latest technology (Anteby et al., 2016). Identifying the path of the emergence of new occupations and professions in response to technological innovations can contribute to understanding this aspect of technology-occupation relations.

Understanding the Multilevel Effects of Technology. Technology has replaced skilled and discretionary work with standardization and limited autonomy over the means of production for many segments of the workforce. By contrast, its use has accelerated income levels and perceived meaningfulness of work for others. We recommend further examination of the top-down effects of technology adoption and diffusion on the transformation of work processes at the organizational, job, and individual levels of analysis. As examples of the former, it could be essential to know the societal and industry-level institutional pressures driving various technologies' adoption.

Similarly, it is likely to be essential to understand how leaders evaluate the potential benefits of these new technologies to various stakeholders prior to adoption. Alternatively, do leaders succumb to normative pressures (e.g., peers adopting these technologies) or exclusively focus on one stakeholder group (e.g., shareholders/owners) over the others? How leaders communicate the potential advantages and disadvantages to various stakeholders upon deciding to adopt a particular technology could also be interesting (e.g., are they open and transparent or selective in their communication?). Similar areas of inquiry are at the employee level. For instance, exploring how employees reconcile the costs and benefits of technology adoption on their jobs and employment should help to understand their attitudinal and behavioral reactions.

Another domain requiring a multilevel approach pertains to the consequences of individualization of employment – where costs of labor traditionally covered by the employer are increasingly pushed onto employees (Fleming, 2017) – on workers' career decisions. An individualized approach toward employment might incentivize organizations to hire full-time workers and build internal labor markets (i.e., invest in long-term career development, provide training, and ensure job security; Pfeffer & Cohen, 1984). In this context, it is important to conduct studies examining how workers seek developmental opportunities and the skills they view as essential in adapting to the changing nature of work.

Leveraging Public Debate and Policy. Finally, we call on researchers to play an active role in informing public policies on how to buffer the negative influences of technology-driven job precarity and insecurity on workers. One such focus of debate and policy might be regarding the role of governments in developing broad frameworks that provide a fair exchange of labor and enable workers to pursue multiple assignments as well as stipulate and regulate the provision of essential services by platforms (e.g., safety, work-schedules, pay, benefits). Second, it has been suggested that there should be a broader discussion regarding the social impact of technology, especially when it is owned and

operated by firms beholden only to their shareholders (Keen, 2018). This discussion might ensure that technological developments are consistent with human livelihood and dignity, not purely profit-driven, and might involve anti-trust laws and responsible human-centric design. Third, there is a small but robust movement toward a universal basic income, as part of which individuals are provided an unconditional cash payment on a recurrent schedule. While universal basic income has been critiqued for possibly disincentivizing work, the evidence mainly indicates a decrease in labor participation only among the elderly, those with care responsibilities, and those in informal work arrangements (Hasdell, 2020), with no appreciable difference in overall labor participation. Although no explicit judgments can be rendered on the large-scale efficacy of universal basic income at this time, we emphasize the importance of experimenting with this and similar policy interventions.

Conclusions

Our systematic bibliometric analysis of the multidisciplinary research related to technology and the future of work suggests that scholars across the disciplines of management, computer science, and sociology, among others, are concerned with a variety of issues that are relevant to the economic development of societies, the effectiveness of organizations, and the well-being of individuals. Specifically, it is important to note an emergence of robust research examining the implications of technology in the gig economy, especially regarding the effects of the use of algorithmic management by online platforms as well as other types of automation in traditional workplaces, and the macro-level examination of technology influences on the labor market. Going forward, we issue a call to researchers to make concerted efforts to collaborate across disciplines to address theoretical and practical relevance issues, thereby ensuring that technology meets its promise to promote development and well-being for all.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Mahesh Subramony  <https://orcid.org/0000-0001-7796-3014>

Supplemental Material

Supplemental material for this article is available online.

References

- Ahsan, M. (2020). Entrepreneurship and ethics in the sharing economy: A critical perspective. *Journal of Business Ethics*, 161(1), 19–33. <https://doi.org/10.1007/s10551-018-3975-2>
- Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. *Journal of Business Research*, 136, 602–611. <https://doi.org/10.1016/j.jbusres.2021.08.011>
- Anteby, M., Chan, C. K., & DiBenigno, J. (2016). Three lenses on occupations and professions in organizations: Becoming, doing, and relating. *The Academy of Management Annals*, 10(1), 183–244. <https://doi.org/10.5465/19416520.2016.1120962>
- 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 and Change*, 25(2), 237–258. <https://doi.org/10.1177/1024529420914473>
- Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Ashford, S. J., Caza, B. B., & Reid, E. M. (2018). From surviving to thriving in the gig economy: A research agenda for individuals in the new world of work. *Research in Organizational Behavior*, 38(1), 23–41. <https://doi.org/10.1016/j.riob.2018.11.001>
- Autor, D., & Salomons, A. (2018). *Is automation labor-displacing? Productivity growth, employment, and the labor share* (No. w24871). National Bureau of Economic Research.
- Autor, D. H., Dorn, D., & Hanson, G. H. (2015). Untangling trade and technology: Evidence from local labour markets. *The Economic Journal*, 125(584), 621–646. <https://doi.org/10.1111/econj.12245>
- Baptista, J., Stein, M. K., Klein, S., Watson-Manheim, M. B., & Lee, J. (2020). Digital work and organisational transformation: Emergent Digital/Human work configurations in modern organisations. *The Journal of Strategic Information Systems*, 29(2), 101618.
- Berger, T., Chen, C., & Frey, C. B. (2018). Drivers of disruption? Estimating the uber effect. *European Economic Review*, 110, 197–210. <https://doi.org/10.1016/j.eurocorev.2018.05.006>
- Bowen, D. E. (2016). The changing role of employees in service theory and practice: An interdisciplinary view. *Human Resource Management Review*, 26(1), 4–13. <https://doi.org/10.1016/j.hrmr.2015.09.002>

- Brawley, A. M., & Pury, C. L. S. (2016). Work experiences on MTurk: Job satisfaction, turnover, and information sharing. *Computers in Human Behavior*, 54, 531–546. <https://doi.org/10.1016/j.chb.2015.08.031>
- Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of our future workplace. *Journal of Management and Organization*, 24(2), 239–257. <https://doi.org/10.1017/jmo.2016.55>
- Burtch, G., Carnahan, S., & Greenwood, B. N. (2018). Can you gig it? An empirical examination of the gig economy and entrepreneurial activity. *Management Science*, 64(12), 5497–5520. <https://doi.org/10.1287/mnsc.2017.2916>
- Cappelli, P., & Keller, J. R. (2013). Classifying work in the new economy. *Academy of Management Review*, 38(4), 575–596. <https://doi.org/10.5465/amr.2011.0302>
- Carpini, J. A., Parker, S. K., & Griffin, M. A. (2017). A look back and a leap forward: A review and synthesis of the individual work performance literature. *The Academy of Management Annals*, 11, 825–885. <https://doi.org/10.5465/annals.2015.0151>
- Caruso, L. (2018). Digital innovation and the fourth industrial revolution: epochal social changes? *AI & Society*, 33(3), 379–392.
- Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3, 349–375. <https://doi.org/10.1146/annurev-orgpsych-041015-062352>
- Coombs, C. (2020). Will COVID-19 be the tipping point for the intelligent automation of work? A review of the debate and implications for research. *International Journal of Information Management*, 55, 102182. <https://doi.org/10.1016/j.ijinfomgt.2020.102182>
- Davies, A. R., Donald, B., Gray, M., & Knox-Hayes, J. (2017). Sharing economies: Moving beyond binaries in a digital age. *Cambridge Journal of Regions, Economy and Society*, 10(2), 209–230. <https://doi.org/10.1093/cjres/rsx005>
- De, R., Pandey, N., & Pal, A. (2020). Impact of digital surge during COVID-19 pandemic: A viewpoint on research and practice. *International Journal of Information Management*, 55, 102171. <https://doi.org/10.1016/j.ijinfomgt.2020.102171>
- 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
- DiRomualdo, A., El-Khoury, D., & Girimonte, F. (2018). HR in the digital age: How digital technology will change HR's organization structure, processes and roles. *Strategic HR Review*, 17(5), 234–242. <https://doi.org/10.1108/SHR-08-2018-0074>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- 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>

- Dylan, B. (1964). *The times they are a changing [Song]*. Universal Music Publishing Group.
- Ernst, E., Merola, R., & Samaan, D. (2019). Economics of artificial intelligence: Implications for the future of work. *IZA Journal of Labor Policy*, 9(1), 2–35. <https://doi.org/10.2478/izajolp-2019-0004>
- Fields, D. L. (2007). Determinants of follower perceptions of a leader's authenticity and integrity. *European Management Journal*, 25(3), 195–206. <https://doi.org/10.1016/j.emj.2007.04.005>
- Flanagan, F. (2019). Theorising the gig economy and home-based service work. *Journal of Industrial Relations*, 61(1), 57–78. <https://doi.org/10.1177/0022185618800518>
- Fleming, P. (2017). The human capital hoax: Work, debt and insecurity in the era of Uberization. *Organization Studies*, 38(5), 691–709. <https://doi.org/10.1177/02F0170840616686129>
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- Gallup Panel. (2020, May 22). Reviewing remote work in the U.S. under COVID-19. <https://news.gallup.com/poll/311375/reviewing-remote-work-covid.aspx>
- Gandini, A. (2019). Labour process theory and the gig economy. *Human Relations*, 72(6), 1039–1056. <https://doi.org/10.1177/0018726718790002>
- Gekara, V. O., & Thanh Nguyen, V. X. (2018). New technologies and the transformation of work and skills: A study of computerisation and automation of Australian container terminals. *New Technology, Work and Employment*, 33(3), 219–233. <https://doi.org/10.1111/ntwe.12118>
- Goods, C., Veen, A., & Barratt, T. (2019). Is your gig any good?" Analysing job quality in the Australian platform-based food-delivery sector. *Journal of Industrial Relations*, 61(4), 502–527. <https://doi.org/10.1177/0022185618817069>
- 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, M. L., & Suri, S. (2019). *Ghost work: How to stop Silicon Valley from building a new global underclass*. Eamon Dolan Books.
- Griep, Y. (2022). Greetings from the new editor: Directions for group and organization management. *Group and Organization Management*, 47(6), 1095–1105. <https://doi.org/10.1177/10596011221115980>
- Guda, H., & Subramanian, U. (2019). Your uber is arriving: Managing on-demand workers through surge pricing, forecast communication, and worker incentives. *Management Science*, 65(5), 1995–2014.
- Hackman, J. R., & Oldham, G. R. (1974). *The Job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects*. Department of Administrative Sciences Yale University. Technical report No. 4.

- Harney, B., & Collings, D. G. (2021). Navigating the shifting landscapes of HRM. *Human Resource Management Review*, 31(4), 100824.
- Hasdell, R. (2020). *What we know about universal basic income: A cross-synthesis of reviews*. https://basicincome.stanford.edu/uploads/Umbrella_Review_BI_final.pdf
- Hiebl, M. R. (2023). Sample selection in systematic literature reviews of management research. *Organizational Research Methods*, 26(2), 229–261. <https://doi.org/10.1177/1094428120986851>
- Howcroft, D., & Bergvall-Kåreborn, B. (2019). A typology of crowdwork platforms. *Work, Employment & Society*, 33(1), 21–38. <https://doi.org/10.1177/0950017018760136>
- Jarrah, M. H., Sutherland, W., Nelson, S. B., & Sawyer, S. (2020). Platformic management, boundary resources for gig work, and worker autonomy. *Computer Supported Cooperative Work*, 29, 153–189. <https://doi.org/10.1007/s10606-019-09368-7>
- Keen, A. (2018). *How to fix the future*. Atlantic Books.
- Kost, D., Fieseler, C., & Wong, S. I. (2018). Finding meaning in a hopeless place? The construction of meaningfulness in digital microwork. *Computers and the Humanities Behavior*, 82, 101–110. <https://doi.org/10.1016/j.chb.2018.01.002>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Lee, C. I., Felps, W., & Baruch, Y. (2014). Toward a taxonomy of career studies through bibliometric visualization. *Journal of Vocational Behavior*, 85(3), 339–351. <https://doi.org/10.1016/j.jvb.2014.08.008>
- Lehdonvirta, V. (2018). Flexibility in the gig economy: Managing time on three online piecework platforms. *New Technology, Work and Employment*, 33(1), 13–29. <https://doi.org/10.1111/ntwe.12102>
- Lent, R. W. (2018). Future of work in the digital world: Preparing for instability and opportunity. *The Career Development Quarterly*, 66(3), 205–219. <https://doi.org/10.1002/cdq.12143>
- Leopold, T. A., Ratcheva, V., & Zahidi, S. (2016, January). *The future of jobs: Employment, skills, and workforce strategies for the fourth industrial revolution*. World Economic Forum.
- Makarius, E. E., Mukherjee, D., Fox, J. D., & Fox, A. K. (2020). Rising with the machines: A sociotechnical framework for bringing artificial intelligence into the organization. *Journal of Business Research*, 120(0148–2963), 262–273. <https://doi.org/10.1016/j.jbusres.2020.07.045>
- Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90(0016–3287), 46–60. <https://doi.org/10.1016/j.jbusres.2020.07.045>
- Morgeson, F. P., Mitchell, T. R., & Liu, D. (2015). Event system theory: An event-oriented approach to the organizational sciences. *Academy of Management Review*, 40(4), 515–537. <https://doi.org/10.5465/amr.2012.0099>

- Nelson, A. J., & Irwin, J. (2014). "Defining what we do—all over again": Occupational identity, technological change, and the librarian/Internet-search relationship. *Academy of Management Journal*, 57(3), 892–928. <https://doi.org/10.5465/amj.2012.0201>
- 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>
- Okhuysen, G. A., Lepak, D., Ashcraft, K. L., Labianca, G., Smith, V., & Steensma, H. K. (2015). Introduction to special topic forum: Theories of work and working today. *Academy of Management Review*, 40(1), 6–17. <https://doi.org/10.5465/amr.2013.0169>
- Ostrom, A. L., Field, J. M., Fotheringham, D., Subramony, M., Gustafsson, A., Lemon, K. N., & McColl-Kennedy, J. R. (2021). Service research priorities: Managing and delivering service in turbulent times. *Journal of Service Research*, 24(3), 329–353. <https://doi.org/10.1177/10946705211021915>
- Parker, S. K., & Grote, G. (2020). Automation, algorithms, and beyond: Why work design matters more than ever in a digital world. *Applied Psychology*, 71(1), 1171–1204. <https://doi.org/10.1111/apps.12241>
- Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology*, 102, 403–420. <https://doi.org/10.1037/apl0000106>
- Pfeffer, J., & Cohen, Y. (1984). Determinants of internal labor markets in organizations. *Administrative Science Quarterly*, 29(4), 550–572. <https://doi.org/10.2307/2392939>
- Piszczyk, M. M. (2017). Boundary control and controlled boundaries: Organizational expectations for technology use at the work–family interface. *Journal of Organizational Behavior*, 38(4), 592–611. <https://doi.org/10.1002/job.2153>
- PricewaterhouseCoopers. (2020). *What is the future of the workplace for consumer-facing companies?* <https://www.pwc.com/us/en/industries/consumer-markets/library/workplace-consumer-facing-companies.html>
- Ramos-Rodríguez, A. R., & Ruiz-Navarro, J. (2004). Changes in the intellectual structure of strategic management research: A bibliometric study of the strategic management journal, 1980–2000. *Strategic Management Journal*, 25, 981–1004. <https://doi.org/10.1002/smj.397>
- Ravenelle, A. J. (2017). Sharing economy workers: Selling, not sharing. *Cambridge Journal of Regions, Economy and Society*, 10(2), 281–295. <https://doi.org/10.1093/cjres/rsw043>
- Richter, S., & Richter, A. (2020). Digital nomads. *Business & Information Systems Engineering*, 62, 77–81. <https://doi.org/10.1007/s12599-019-00615-1>
- Rudolph, C. W., Allan, B., Clark, M., Hertel, G., Hirschi, A., Kunze, F., & Zacher, H. (2021). Pandemics: Implications for research and practice in industrial and organizational psychology. *Industrial and Organizational Psychology*, 14(1–2), 1–35. <https://doi.org/10.1017/iop.2020.48>
- Santana, M., & Cobo, M. J. (2020). What is the future of work? A science mapping analysis. *European Management Journal*, 38(6), 846–862. <https://doi.org/10.1016/j.emj.2020.04.010>

- Shankar, V., Kalyanam, K., Setia, P., Golmohammadi, A., Tirunillai, S., Douglass, T., Hennessey, J., Bull, J. S., & Waddoups, R. (2021). How technology is changing retail. *Journal of Retailing*, 97(1), 13–27. <https://doi.org/10.1016/j.jretai.2020.10.006>
- Shestakofsky, B. (2017). *Working algorithms: Software automation and the future of work. Work and Occupations*, 44(4), 376–423. <https://doi.org/10.1177/0730888417726119>
- Spencer, D. A. (2018). Fear and hope in an age of mass automation: Debating the future of work. *New Technology, Work and Employment*, 33(1), 1–12. <https://doi.org/10.1111/ntwe.12105>
- Spreitzer, G. M., Cameron, L., & Garrett, L. (2017). Alternative work arrangements: Two images of the new world of work. *Annual Review of Organizational Psychology and Organizational Behavior*, 4(1), 473–499. <https://doi.org/10.1146/annurev-orgpsych-032516-113332>
- Sutherland, W., & Jarrahi, M. H. (2018). The sharing economy and digital platforms: A review and research agenda. *International Journal of Information Management*, 43(0268–4012), 328–341. <https://doi.org/10.1016/j.ijinfomgt.2018.07.004>
- Tassinari, A., & Maccarrone, V. (2020). Riders on the storm: Workplace solidarity among gig economy couriers in Italy and the UK. *Employment & Society*, 34(1), 35–54. <https://doi.org/10.1177/0950017019862954>
- U.S. Bureau of Labor Statistics. (2020). *Employment recovery in the wake of the COVID-19 pandemic*. <https://www.bls.gov/opub/mlr/2020/article/employment-recovery.htm>
- 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>
- Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- Van Eck, N. J., & Waltman, L. (2014). Visualizing bibliometric networks. In *Measuring scholarly impact* (pp. 285–320). Springer.
- Van Eck, N. J., Waltman, L., Dekker, R., & Van Den Berg, J. (2010). A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS. *Journal of the American Society for Information Science and Technology*, 61(12), 2405–2416. <https://doi.org/10.1002/asi.21421>
- Veen, A., Barratt, T., & Goods, C. (2020). Platform-capital's 'app-etite' for control: A labour process analysis of food-delivery work in Australia. *Work, Employment & Society*, 34(3), 388–406. <https://doi.org/10.1177/0950017019836911>
- Wang, B., Liu, Y., & Parker, S. K. (2020). How does the use of information communication technology affect individuals? A work design perspective. *The Academy of Management Annals*, 14(2), 695–725. <https://doi.org/10.5465/annals.2018.0127>
- Willcocks, L. (2020). Robo-apocalypse cancelled? Reframing the automation and future of work debate. *Journal of Information Technology*, 35(4), 286–302. <https://doi.org/10.1177/0268396220925830>

- Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019b). Good gig, bad gig: Autonomy and algorithmic control in the global gig economy. *Work, Employment & Society*, 33(1), 56–75. <https://doi.org/10.1177/02F0950017018785616>
- Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019a). Networked but commodified: The (dis) embeddedness of digital labour in the gig economy. *Sociology*, 53(5), 931–950. <https://doi.org/10.1177/0038038519828906>
- Zupic, I., & Cater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>
- Zwick, A. (2018). Welcome to the gig economy: Neoliberal industrial relations and the case of uber. *GeoJournal*, 83, 679–691. <https://doi.org/10.1007/s10708-017-9793-8>

Associate Editor: Xander Lub

Submitted Date: August 12, 2022

Revised Submission Date: October 18, 2023

Acceptance Date: October 19, 2023

Author Biographies

Mahesh Subramony is a professor of management at Northern Illinois University, USA. His research is in the areas of strategic human resource management, service management, and the transformation of service frontlines.

Sven Kepes is a professor of Management and Entrepreneurship at Virginia Commonwealth University, USA. His research is in the areas of strategic human resource management, compensation system characteristics, staffing, meta-analysis, publication bias, sensitivity analysis, and the trustworthiness of our cumulative knowledge.

Dana Yagil is a full professor in the Department of Human Services at the University of Haifa, Israel. Her research interests lie in interpersonal relationships in organizations and in the psychology of customer services.

Markus Groth is a professor of organisational behaviour in the School of Management and Governance at the UNSW Business School, UNSW Sydney. His research explores the role of emotions in the workplace, specifically, the link between employee experiences of work and service quality experiences of the customers they serve, the behavioural and emotional components of service interactions, as well as the strategies organisations employ to form and maintain relationships with their customers.

David Solnet is a professor of service management and service employment in the UQ Business School in Queensland, Australia. His research focuses on service climate, service culture, employee engagement, Generation Y as service workers, and the relationships between management practices, employee attitudes and firm performance.