

Bonding in Isolation: Worker Collectives in the Digital Space

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Executive Summary

Background

Accelerating digitalization has favoured the emergence of scattered workplaces and created a trend towards asociality. Worker collectives, i.e., formal and informal groups in which workers connect and bond, seem at risk of dissolution. For instance, teleworking deprives workers of shared physical spaces, thus weakening their connectivity. At the same time, however, digital technologies offer new ways to connect people, providing an alternative to physical togetherness and laying a new foundation for worker collectives.

Objectives

Our synthesis of the literature on worker collectives and digital technologies highlights gaps in knowledge, suggests future research avenues, and underlines policy implications, with the larger goal of catalyzing cross-disciplinary study.

Results

Our analysis of the literature identified four major themes: collectives for digital workers, the digitalization of unions and other labour organizations, virtual communities of practice, and enterprise social media.

The formation and dynamics of collectives for digital workers, primarily online platform workers or gig workers, represent fast-growing areas of research. Algorithms are viewed as a novel form of power that facilitates exploitation, silences worker voice, and suppresses resistance. Given these characteristics, platform-dependent workers are a core group for collective organizing. There is evidence of gig worker communities around the world acting as spaces to support peers, share information, and build solidarity. Some communities have become the backbone of collective action, although gig workers do not appear very mobilizable because they are physically scattered. Some research analyses the impact of digital technologies on trade unions in building and nurturing worker collectives, but the use of digital technologies differs across unions, depending on structural characteristics and leadership strategies. Social media offer enormous potential for unions to outreach to existing and potential members and to a wider range of militant individuals and organizations in the general public. Much of that potential is untapped because unions tend to use social media in a more traditional manner for one-way communication. Unions also try to adapt digital technologies to their traditional needs rather than viewing them as an opportunity to revise their premises. New non-union labour movements are more extensively exploring digital technologies for networking and mobilizing, despite the limited ability to organize a structured movement that will endure over time.

Virtual communities of practice, or VCoPs, are online communities that connect people in the same trade or who share common interests. These communities act as tools of knowledge dissemination and organization or as space to share personal and community experiences, especially among those with lower job profiles. VCoPs bridge workers, create a form of solidarity, and at times organize workers.

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Enterprise social media (ESMs) are online platforms facilitated by employers to allow their employees to connect and share knowledge. Employers often initiate ESMs for the purpose of knowledge sharing. ESMs have both positive and negative outcomes, but it is not clear whether they foster a collective worker identity to seed worker collectives or simply replace the need to organize independent of employers.

Key messages

Across the four themes, three key messages emerge. First, digital technologies are tools that can either improve or undermine sociality; strategies deployed by involved actors, in particular, leaders and decision makers, are crucial for sociability outcomes. Second, digital technologies may facilitate the development of relationships and networks. Despite being a fundamental basis for collective action, those relationships and networks *per se* are not sufficient for organization and mobilization. They need to be activated, attuned, and directed towards a specific target to trigger change in employment relations. Third, digital technologies seem to support short-lived worker mobilizations. The development of a mobilizable, powerful, and sustainable collective worker requires effective organization strategies.

Methodology

We used a set of keywords related to collective workers and digital technologies (e.g., union, collective, algorithm, social media, and possible permutations of these) to search articles in *management*, *sociology*, and *industrial relations and labour* fields on Web of Science's Social Science Citation Index. We identified 1546 articles; after analysis, we determined 193 were central for our review. We grouped the articles under four themes (some fit more than one theme): collectives for digital workers, the digitalization of unions and other labour organizations, digital communities of practice, and enterprise social media. In the analysis of each paper, we paid particular attention to the main findings, methods of investigation, and policy implications.

1. Introduction

Worker collectives, i.e., formal and informal groups where workers connect and bond (such as unions), play a critical role in modern labour and employment relations (Budd, 2018; Freeman & Medoff, 1985). Yet accelerating digitalization is leading to scattered workplaces and a trend towards asociality; against this backdrop, the future of worker collectives is debatable. On the one hand, many digital workplace innovations, such as teleworking, deprive workers of shared physical spaces, thus weakening connectivity (Aroles et al., 2019; Golden et al., 2008; Nakrošienė et al., 2019; Vayre & Pignault, 2014). On the other hand, digital technologies offer new ways to connect people, providing an alternative to physical togetherness and laying a new foundation for worker collectives (Maffie, 2022; Walker, 2021; Wood et al., 2018).

The extant research at the intersection of digitalization and worker collectives has outlined the challenges and opportunities of digitalization. This body of research has three key *strengths*. First, it examines one of the most current issues in workplaces. It thus has a high potential to influence policymakers, unions, and human resource practitioners to shape a healthy future for worker collectives and workplaces. Second, the topic brings together the expertise and perspectives of several disciplines, including industrial relations, management, and sociology. Each discipline brings its own theoretical framework and focuses on different stakeholders; accordingly, this interdisciplinary investigation presents a multi-faceted picture of worker interactions and collectives in the time of digitalization. Third, this body of research adopts a variety of methods and calls on a variety of stakeholders to act as informants (e.g., Minter, 2017; Staples & Whittall, 2021), yielding valuable insights into the current state of digital worker collectives. Many studies use novel methods to collect and analyse data generated in virtual spaces, for example, websites (Frangi & Zhang, 2022), social media (e.g., Frangi et al., 2020), and online forum posts (e.g., Panteli et al., 2020).

Future research may be limited by a few key *weaknesses*. The current state of the research is largely discipline bounded, limiting the ability of future work to draw upon various perspectives, expertise, and methodologies to probe the complexity of digital worker collectives. Moreover, the extant research often takes a piecemeal approach, tends to favour opposing pictures (i.e., either the decline or the revival of worker collectives), and lacks nuance in the effects of digitalization on worker collectives. Given these shortcomings, this body of knowledge has had limited impact in the practical world.

Our synthesis of the literature aims to highlight current knowledge and research gaps, illuminate future research avenues and policy implications, and catalyze cross-disciplinary study. This report proceeds as follows. Section 3 introduces the method and the process we used to identify and review the literature. Section 4 gives the findings, organized by the four major topics we discovered in the literature. Section 5 discusses implications for policies, and Section 6 offers a conclusion. Finally, in Section 7, we preview our knowledge mobilization plans to diffuse the findings and maximize their practical impact.

2. Literature Review Method

2.1 Literature Identification

The goal of this review was to synthesize the extant knowledge on work and workers in the broad context of digitalization and develop an agenda for future research. To ensure the literature we reviewed was identified in a transparent manner, free from bias, we followed the guidelines for a systematic literature review at the literature identification stage (Tranfield et al., 2003). Based on our objectives, we developed a protocol that defined a strategy to search and identify relevant work. We limited the scope of the review to articles in peer-reviewed journals in the English language and selected Web of Science's Social Science Citation Index (SSCI) as our target database to search and collect published research. We chose SSCI because of its interdisciplinarity and wide coverage of the most influential journals in social sciences (*Web of Science: Social Sciences Citation Index*, n.d.). It also gives the dates for each article's citations; we saw this as an important indicator of the quality and impact of articles. We restricted year of publication to 2005 and thereafter. We included early-access articles that were available at the time of search (March 28, 2022).

We defined our search term as any of three words and their derivatives describing workers (worker* OR labour OR employee* OR freelancer*) co-appearing with any of a group of words describing collectives for workers (union* OR solidarity OR collective* OR voice OR community* OR group* OR bond* OR network) and a group of words describing digitalization, including a list of digital technologies widely discussed by workers ("artificial intelligence" OR AI OR automat* OR algorithm* OR smartphone OR mobile OR digital* OR virtual OR online OR gig OR microwork* OR platform OR crowdsource* OR "social media" OR SNS OR web* OR internet). This search term was finalized after many iterations. We performed our search with the resulting search term in *topic* (title, keywords, or abstract) and refined our search to Web of

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Science categories *management*, *sociology*, and *industrial relations labor* and document type *articles*. This returned 1,526 articles.

Next, with the help of Covidence, a web-based application designed to facilitate systematic literature reviews, the first author and a research assistant cross-examined all the articles for their relevance to the review. In the first round of filtering, we screened the title and abstract and determined that 1,232 articles were irrelevant. In the second round, we skimmed through the full texts of the remaining articles and further excluded 121 articles. This left 193 articles for review.

2.2 Literature Grouping

The literature screening process allowed the first author to identify several emerging themes in the body of work identified. With a further review of the titles and abstracts of the 193 articles, the first author refined the four major themes: 1) collectives for digital workers, primarily workers on online work platforms; 2) the digitalization of unions and other traditional worker collectives; 3) digital communities of practice, where workers converse in virtual spaces for the purpose of their work rather than for purposes of organization; 4) social media initiated and managed by employers.

Two research assistants categorized the articles under these four themes; several were assigned to two groups because of their relevance to both themes. For instance, a paper entitled “Trade Unions and Platform Workers in the UK: Worker Representation in the Shadow of the Law” (Bertolini & Dukes, 2021) seemed relevant to Themes 1 and 2.

3. Findings

In this section, we synthesize and analyse the knowledge in the literature according to the four themes.

3.1 Collectives for Digital Workers

The formation and dynamics of collectives for digital workers, primarily online platform workers, is the most recently emerging and fastest growing theme. It shows how the online gig economy has burgeoned since the late 2010s. The articles grouped under this theme enabled us to: 1) evaluate the need and potential for worker collectives and collective voices among online platform workers; 2) summarize different approaches to organize collectives and collective actions among online gig workers, including grassroots organizing and union-led organizing, and compare and evaluate the effectiveness of different approaches; 3) summarize practical suggestions for

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legislation and other macro environments; and 4) assess the current state of research and pinpoint directions for future research.

The growing research on the online gig economy has accumulated abundant knowledge on the realities and struggles of online gig work, as well as mechanisms individual workers use to cope with adversity in the online gig economy. Several articles attribute the weak worker voices to algorithmic management. Walker et al. (2021) proposed the use of algorithms constitutes a novel form of power that facilitates exploitation and displaces resistance. Algorithmic management dehumanizes management and naturalizes management decisions as “inevitable hurdles that can only be navigated or ‘gamed’” (p. 28). Similarly, Kougiannou and Mendonça (2021) argued that given the information asymmetry of algorithms and the tactic of terminating workers unilaterally, gig work platforms can actively silence worker voices. Suppression of voice, therefore, is inherent to algorithmic management, the core control mechanism of online work platforms.

Without accessible individual voice channels, collective organizing seems a viable choice for gig workers. While there is a great deal of knowledge about the adversity facing online gig workers, much less is known about the actual demand for and feasibility of functioning collectives among online gig workers. Some research points to diversity in workers’ attitudes to organizing and collectives. Newlands et al. (2018) surveyed gig workers in 12 European countries and identified five types of labour activists based on the clustering of opinions and behaviours with respect to collective action and perceived solidarities (see Figure 1): activist employment advocates (belief in the feasibility of collective action and unionization for platform workers and active engagement with other workers in online communities), moderate employment activists (moderate belief in collective actions and unionization for platform workers and moderate online engagement with other workers), independent collectivists (relatively strong belief in organizing platform workers and online engagement with other workers, without a belief in unionization), independent individualists (moderate belief in collective organizing but weaker belief in unionization and moderate online engagement with other workers), and independent opponents (weak belief in organizing and unionization and little engagement with other providers on platforms). The researchers observed differences in the groups’ demographics and national concentrations but found workers’ dependence on platforms and their use frequency were more overt differentiators of attitudes. As the most comprehensive attitudinal research, to the best of our knowledge, this study underscores the heterogeneity in workers’ interest and beliefs, as well as the

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subsequent complexity for organizing – with or without unionization, local or transnational, and regardless of unit of organizing (e.g., by platform, occupation). The importance of dependence on platforms resonates with Wood et al.'s (2021) finding that the dependence on platforms, along with workers' anger at platforms and communication with other workers, is associated with support for collective organization. Taken together, the two studies highlight platform-dependent workers as a core group for collective organizing.

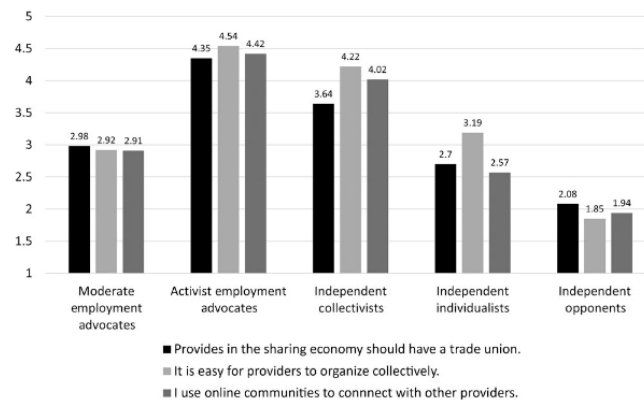


Figure 1. Clustering of workers and arithmetic means for three key items in an attitudinal survey in 12 European countries (Newlands et al., 2018, p. 259)

Despite evidence of a lack of enthusiasm or capacity for effective organizing and wide observations that collective resistance is largely absent (Stanford, 2017; Walker et al., 2021; Wood et al., 2019), some research has documented the formation of gig worker groups across the globe. The most prevalent types are online worker communities facilitated by social media sites, online forums, and virtual chat groups. Research across disciplines finds participation in these communities is a hallmark of work experience for many, although the degrees of engagement vary greatly across individuals (Keith et al., 2019). In these communities, workers share information and coping tactics and offer peer support (e.g., Ford & Honan, 2019; Gregory, 2021; Lehdonvirta, 2018). Digital communities help professional workers on platforms find meaning in their work through knowledge sharing and collaborative relationships (Schwartz, 2018). They also help build workers' personal environments (e.g., connections, interpretation of activities) so they can better cope with precarity (Petriglieri et al., 2019).

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Some of the communities for workers who deliver local services (e.g., drivers, food couriers) outreach into in-person networks that help workers navigate online work. For example, Parth et al. (2021) documented an incident in India; around 10 drivers quickly gathered to protest a policeman harassing one cab driver after the driver posted in a chatgroup. However, some scholars argue that despite its ability to enhance mobilizational capacity, the strong “mutual aid logic” in these grassroots digital communities renders them insufficient for forming collectives to challenge the power of platforms and bring structural change (Ford & Honan, 2019).

Yet this does not mean online communities are meaningless for worker solidarity and functional collectives. Maffie (2020) found frequent interactions with other gig workers in online communities fosters long-term bonds among workers and shapes a shared sense of collective grievance against platforms; this, in turn, is associated with a positive view of union instrumentality and increased interest in joining a union. Panteli et al. (2020) identified strong identification in online micro-worker communities on Amazon Mechanical Turk (Turkers). During a campaign, worker communications in an online forum not only displayed a shared Turker identity, but also galvanized collective voice. Engagement in online communities, therefore, may not only be a precursor for collective organizing via shaping collective identity; it may also function as a proxy for collectives to gain more voice in certain circumstances.

Among the numerous studies showing the critical role of online communities in worker experiences, a few have found functional worker collectives or collective worker resistance can arise in these spaces, including strikes and protests by rideshare drivers in India (Parth et al., 2021), and food couriers in China (Lei, 2021), UK (Tassinari & Maccarrone, 2020) and Italy (Cini & Goldmann, 2021; Tassinari & Maccarrone, 2017, 2020) to demand better pay and working conditions. A key commonality across cases is what Parth et al. (2021) termed “phygital” (physical and digital) free spaces to access a co-worker network; in these spaces, workers can bond and bridge, as well as mobilize solidarity. On the one hand, this explains why collective actions are so far only observed for rideshare drivers and food couriers, the two major gig worker groups who deliver services locally and thus have a shared space for physical togetherness. On the other hand, it highlights the potential of and a necessary condition for digital worker groups to develop into effective gig worker collectives. Yet it is difficult to conclude that the documented collective action cases have achieved the pay and working conditions demanded by workers.

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In some organizing and mobilizing cases, workers have overcome the challenge of operating outside an established collective bargaining framework and organized at the grassroots level, but unions have started to “catch up” in more recent years (Trappmann et al., 2022). Some studies show unions can be enablers of solidarity among online gig workers, depending on their ability to adapt strategies and practices to the new gig work context (Tassinari & Maccarrone, 2020). Studies on unions’ role in mobilizing and representing online gig workers often take an international comparative perspective to uncover factors driving different union behaviours. Borghi et al.’s (2021) study of Italian and French unions representing platform workers found that unlike their French counterparts, Italian unions do not develop alliances with other actors, such as grassroots groups, because of their historic fracture and mutual distrust. Similarly, Cini and Goldman (2021) found British grassroots groups ally with unions but Italian grassroots groups tend to self-organize. This study used differences in union capacity and tradition of militancy to explain the differences in organizing forms. Notably, research on unions’ roles is predominantly European based, with disproportionate attention to Italian unions.

Overall, given the evidence from the body of research we reviewed, we conclude online gig workers as a group have not demonstrated the enthusiasm or capability needed to form collectives to influence working conditions. Nor is the online gig economy showing potential to become the new frontline for labour activism. Still, certain sub-groups of gig workers, for example, drivers and food couriers, have shown they have the potential to organize and mobilize because of their access to “phygital free spaces” (Parth et al., 2021). Organizing subgroups more prone to collective actions may be a new terrain for union renewal, although the behaviour and performance of unions are still tied to institutional traditions and contextual factors.

Given the recent and fast-growing nature of this body of research, the first direction we suggest for future research is to update our review of the expanding knowledge and supplement our report by referring to a larger set of disciplines. We have further identified three specific research avenues that should be pursued in future work:

- 1) *Enhance analysis with a systemic perspective.* Our analysis of the literature about collectives for digital workers highlights the importance of factors at different levels, including individual (workers, activists, union members, union officials), organizational (union, online community groups, platforms), and institutional (industrial relations systems, national and local legislation) characteristics. However, there is a lack of research into their interactions and how

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these factors together affect a broad-base digital organizing. Inter-level examination of digital organizing efforts would help unravel the complexity of the initiation and effectiveness of digital worker organizing.

2) *Expand the scope of analysis.* Most studies focus on successful cases of organizing digital workers. The lack of a systematic analysis of both successful and unsuccessful organizing limits our ability to assess the potential of digital organizing. We invite scholars to collect data on organizing efforts regardless of the outcomes and develop clear measures and standards for evaluating the success of digital organizing. This would create a framework for comparison across digital organizing efforts and systematically identify key conditions for success.

3) *Enhance theory.* The reviewed literature lacks an overarching theoretical framework to integrate existing work and guide future research. Given its intimacy with the topic and its interdisciplinary nature, the industrial relations discipline may be in the best position to bring together theories from different fields and develop a framework to deepen the understanding of digital workers and their organizing.

3.2 Digitalization of Unions and Other Labour Organizations

Over the years, research on the use of digital technologies by unions and other labour organizations has evolved as technology has advanced. This line of research started with an examination of unions' use of what we now see as "primitive" forms of the Internet and information and communications technologies (ICT). It was mostly optimistic about the ability of technology to achieve union goals, but sometimes underscored possible tensions with traditional union strategies (Hertenstein & Chaplan, 2005; McBride & Stirling, 2014; Muir, 2010). After 2010, a large body of research on the use of social media began to emerge. Since then, the topic has dominated the research on unions' and other labour organizations' digitalization. This research has tackled union use of social media in organizing, reviving the union movement, and renewing unions more generally (Hodder & Houghton, 2020; Pasquier et al., 2020; Underhill et al., 2020). A recent case study on the adoption of AI-enabled chatbots by a labour network and a union can be seen as launching research on a new generation of technologies used by unions and labour organizations (Flanagan & Walker, 2021). The study showed how this burgeoning new technology can be used to reinforce union narratives and promote solidarity among workers.

Unions currently use digital technologies to leverage their ability to support "on the ground" campaigns. In these cases, their usage of digital technologies is mostly part of the "phygital"

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process explained above (Parth et al., 2021; Pasquier et al., 2020; Underhill et al., 2020). This synergy between physical and digital actions has the potential to empower unions (Carneiro & Costa, 2022).

The use of digital technologies differs across unions, however, and varies based on union characteristics (size, sector etc.), union leaders' strategic choices, and internal politics (Pulignano, 2009). The divergent uses of ICTs, in turn, can affect the outcomes of a campaign and mobilization efforts (Blanc, 2021). Contrary to arguments of techno-determinism, this suggests that although digital technologies afford visibility, intensification, aggregation, and addressability, the degree of these positive outcomes often depends on union strategies and choices (Hennebert et al., 2021).

While many researchers are optimistic about union use of digital technology, others note limitations and raise concerns. Unions seem to leverage digital technologies in a conservative manner for their traditional organizing and mobilizing strategies. As a study in Sweden showed, unions seem to adapt new technologies to their traditional goals, such as strengthening and reviving membership, without fully exploring the regenerative potential of social media to re-formulate union premises, structure, and internal dynamics (Scaramuzzino & Scaramuzzino, 2020). Thus, the use of social media centres on a one-way communication strategy, without taking advantage of the high potential of the dialogic interaction offered by social media (Costa & Carneiro, 2021). Unions also seem unable to engage in social media to take advantage of their potential to extend outreach. This has resulted in a limited number of social media followers made up of almost exclusively already union-related militant profiles (Costa & Carneiro, 2021). Even targeted union strategies, such as one for youth sections of British unions, have shown an "echo chamber effect" (Clark & Van Slyke, 2010), with only those already active becoming increasingly active. Overall, the potential reach has not been achieved (Hodder & Houghton, 2020). The case is different when digital technologies are used to enable a set of actions spurred by a renewed vision of unions beyond the traditional union borders. For instance, Underhill et al. (2020) showed how a union's efforts towards renewal by including unrepresented, precarious immigrant workers were boosted by a dialogic interaction with ethnic community social media accounts, paving the way to the formation of a genuine network collectivism.

While new ICT has created many opportunities for trade unions, it also plays a structural role in many social movements seeking to improve labour conditions. For example, coalitions of civil society organizations, labour rights activists, and consumers have emerged on social media

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in “shame the name” campaigns. These non-union, social media-based movements have addressed gigantic corporations, such as Apple, Walmart, and Foxconn, extending the political space of fights for better working conditions from local to international (Caraway, 2016; Pun et al., 2019). Some movements, such as the “Organization United for Respect at Walmart (OUR Walmart)” campaign (Caraway, 2016) and teachers’ walkouts in Oklahoma and Arizona (Blanc, 2021), have leveraged social media to create union-like dynamics in workplaces where traditional union organizing has been extremely difficult. Other non-union labour movements have found in social media a pivotal resource for developing a network collective by attracting individual social actors, including unions. For example, the “Fight for \$15” campaign saw a variety of actors coming together in online communities to pressure jurisdictions to legislate increased minimum wages (Frangi et al., 2020; Pasquier et al., 2020).

Although social media have played an important role in mobilizing different social actors around labour-right related causes and bringing untenable labour conditions to the forefront of local and global public debates, some limitations are evident. First, these movements are short-lived and have limited impact if not coupled with organizing strategies, carefully planned, and led by a leadership able to knit together a “phygital” network that can endure and promote structural changes in workplaces (Blanc, 2021). Second, unlike traditional on-the-ground union organizing, digital activism in non-union labour movements does not empower lower working classes to participate and lead, but seems to favour the participation and leadership of middle-class, highly skilled, and more resourceful social actors (Schradie, 2018).

Across all these experiences, the extent to which digital technologies are a blessing or a curse for traditional unions and new labour movements remains open for debate. Optimists highlight the potential of digital technologies to empower and revitalize unions, back-bone new labour movements, and ultimately improve labour rights and working conditions (Bryson et al., 2010; Flanagan & Walker, 2021). Less optimistic views underline that digital unionism has found more support among academics than actual rank-and-file trade unionists (Carneiro & Costa, 2022). Digital technologies can exacerbate competition within and across unions, as well as between unions and new labour movements (Frangi et al. 2020). Indeed, social media-based movements may temporarily suppress the demand for unionization, but they do not have the capacity to become an enduring force to balance power in the workplace.

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The review of the literature on digital unionism and the role of digital technologies in new form of labour movements suggests several possible future research directions.

1) *Develop a multi-level framework for analysis*: Most studies under this theme focus on variables or actors at a single level (individuals, unions, groups), but, in fact, factors and actors at different levels may interact. For instance, union strategies at the confederation or federation level might have an impact on local union use of social media. In turn, digital strategies at a lower level can impact those at higher levels. The strategic usage of digital technologies by unions and new labour movements can be better understood through an interactive evaluation of factors at different levels. Research under this theme implies a possible link between online and on-the-ground dynamics but lacks empirical validation of this connection. We invite scholars to empirically investigate the issue over time.

2) *Diversify empirical approaches*: This body of research is primarily case-driven and lacks empirical diversity. We invite scholars using various empirical approaches to come together and deepen the understanding of this topic. Quantitative studies of online networks and their dynamics should be coupled with in-depth qualitative approaches to validate the existence of a link between actors at different levels and between physical and digital activism. Moreover, longitudinal analyses are essential to look for possible causal effects in these relationships.

3) *Enrich theory*: The theoretical framework and the contributions of this body of research are generally limited. We thus invite scholars to ground their analyses in a stronger theoretical framework to better structure future research.

3.3 Virtual Communities of Practice (VCoPs)

VCoPs are online communities connecting people who share a common interest or are in the same trade. They offer a platform where people can exchange and organize outside a physical space. Because of the new forms of worker organization these communities generate, VCoPs are relevant to labour organizing and the labour movement in contemporary times (Bange et al., 2022; Maheshwari et al., 2021; Turulja et al., 2021), particularly as new technologies and the COVID-19 pandemic have normalized virtual work (Zhang et al., 2021), and unions have declined (Heckscher & McCarthy, 2014).

Research under this theme fall into five sub-topics: 1) workers' engagement with platforms designated for work and knowledge sharing; 2) workers' engagement with other platforms, such

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as social media, blogs, and forums; 3) the outcomes of workers' engagement in VCoPs; 4) employers' involvement in VCoPs; 5) the use of VCoPs among immigrant workers.

Research in the first sub-topic shows VCoPs act not only as channels for knowledge dissemination amongst workers who are mostly in IT-related fields (David & Rullani, 2008; Hennekam et al., 2019; Li, 2010; Singh et al., 2018; Weststar, 2015) but also as spaces where field-related issues are addressed and practices are standardized (X. Ma et al., 2018; Moqri et al., 2018; Posada, 2022).

The second sub-topic concerns the use of social media, blogs, and forums – more informal and casual spaces where workers engage with peers and share their personal and community experiences. These virtual communities reach wider groups of workers than those oriented towards knowledge dissemination (Haas et al., 2021; Naeem, 2020; Nayak et al., 2022). In this body of research, it is not always clear whether the participating workers are unionized or not, but studies indicate these informal virtual groups can build bridges between workers, potentially fostering solidarity within and across groups (Botelho & Abraham, 2017; Saundry et al., 2007; Sayers & Fachira, 2015).

The third sub-topic more specifically centres on outcomes of workers' engagement in VCoPs. It has some overlaps with the first two themes, because VCoPs, with their open and free nature, are terrains where workers with the same complaints and demands meet and amass, fostering solidarity and creating the potential for organizing and unionizing (Massa, 2017; Patrick-Thomson & Kranert, 2021). Positive outcomes have also been found at the individual level. For example, VCoPs can enhance workers' abilities to job-hop and find new environments with better working conditions (Chan, 2008; Fitzgerald et al., 2012; Upchurch & Grassman, 2016; Yin, 2018).

The fourth sub-topic draws on the ways employers engage in VCoPs. Employers use social media to engage employees and thus facilitate better employee-management communication, but this is often an uneasy connection (Hwang et al., 2015; Lehdonvirta, 2018; Li-Ying et al., 2018). Employees may need incentives, and engagement tactics should be tailored to different groups of workers to increase virtual engagement with management and retain workers (Mirvis & Googins, 2018; Richards & Kosmala, 2013; Yan et al., 2018).

The last sub-topic focuses on the ways migrant workers engage in VCoPs. As a marginalized group, migrant workers often take precarious jobs, are under paid, and have little access to collective voice (Babis, 2021; Golan & Babis, 2019). Research shows VCoPs have

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become the main space for some diasporas to connect, communicate, offer support, and organize because of the lack of an official structure (McPhail & Fisher, 2015; Montgomery, 2007).

There is a thin line differentiating virtual groups based on whether they target organizing and generating dissent or are more interested in information exchange and peer support (Bernal, 2006; King & Lee, 2016; Paroutis & Al Saleh, 2009). This leads to frequent overlapping of and interconnections between the five sub-topics. Therefore, future work ought to actively pursue the following research avenue.

1) *Identify VCoP types and their usage*: More empirical research is needed to understand links between and differentiations of VCoPs, notably whether they are used for organizing and dissidence or for other reasons. With this knowledge, we would better understand the necessary conditions for a VCoP to become an organizing and mobilizing agent. For marginalized groups, such as migrant workers, VCoPs may become effective collective actors in employment relations.

3.4 Enterprise Social Media (ESM)

During the last decade, the topic of ESM has been extensively researched. ESMs are intracompany online platforms, mostly initiated and monitored by employers, allowing individuals and teams to connect and communicate. They can help connect company silos to improve communication. Some examples are Teams, Yammer, Jive, Chatter. The articles under this theme have three main sub-topics: knowledge and idea sharing, participation in ESMs, and the impacts on employees and organizations.

Knowledge sharing is often the primary reason for companies to initiate ESMs, and research has found some interesting dynamics in the quality of knowledge exchange. Pu et al. (2002) analysed the effects of hierarchy in corporate Q&A communities and found knowledge providers answer questions with more effort when the inquiry comes from higher ranked knowledge seekers. Similarly, Beck et al. (2014) found that the higher a knowledge seeker's social status, channel variety, and social presence, the better the quality of knowledge sought. Individuals seem more apt to share knowledge when they are confident in their ability to provide correct information (Abdelwhab Ali et al., 2019). Another factor affecting knowledge sharing motivation is personal development intentions. For example, expected gains in reputation and anticipated reciprocal benefits can positively motivate an employee to share information (Rode, 2016). Research has also pointed to factors that negatively impact the motivation to share knowledge on ESMs. One factor is spatial separation; van der Meulen et al. (2019) found employees separated

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spatially (working fully from home and away from other workers) and temporally (working in different time zones) had a much lower frequency of knowledge sharing.

Knowledge sharing can have positive outcomes at both individual and organizational levels. For individuals, ESMs can help fulfill a sense of belonging and foster connections with others (Berraies et al., 2020). Ma et al. (2022) found that both knowledge acquisition and knowledge provision on ESMs were positively associated with work performance (Ma et al., 2022). At an organizational level, knowledge sharing practices can positively affect organizational growth, reduce costs, and yield intangible benefits, such as innovation, which together create a competitive advantage (Abdelwhab Ali et al., 2019; Elerud-Tryde & Hooge, 2014).

Employee participation is essential for the success of ESMs. In this sub-topic, we noted factors driving employee participation in ESMs for purposes unrelated to knowledge sharing (reviewed in the first sub-topic). Participant involvement seems to be greatly affected by employees' experiences with ESMs. Examining an ESM in a large German courier company, Meske et al. (2019) found employee participation could be traced to hedonic motivations to gain pleasure by learning and bonding on ESMs. Individual values were found to shape participation intentions as well. Wendelken et al. (2014) found employees are more likely to participate if they value their career, reputation, linkage to the company, and self-development. Employees who are less likely to participate see more value in their family and hobbies, free time, financial compensations, or keeping a distance from the company.

A sizable body of work under this theme has investigated the impact of ESMs on both organizations and employees, beyond the effects of knowledge sharing discussed above. Enterprise social software platforms used to connect teams have a strong positive effect on task performance, specifically non-routine tasks (Kuegler et al., 2015), and this positive performance effect extends to work-related use of external social media (Liang et al., 2021). ESMs have been found to increase employee satisfaction (Liang et al., 2021), build emotional capital, increase information flows, improve collaboration, lower turnover, and increase employee motivation (Huy & Shipilov, 2012).

Nevertheless, these social platforms can have a negative impact on employees and organizations. After studying 36 organizations using ESMs in China, Ding et al. (2019) concluded relationship-oriented ESM usage can increase interruptions and decrease productivity. Another study found excessive ESM use can cause the overload of both information and social support received (Chen & Wei, 2019).

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Our review revealed few gaps in the research on ESM and we offer the following suggestions to guide future research.

1) *Expand the analytic lens*: There needs to be a systematic analysis of organizational, team, and individual use of ESMs. Existing evidence is often contrasting and suggests the need to pay more attention to the nuances in the implementation of and participation in ESMs, considering both the participation and the outcomes.

2) *Formulate practical suggestions for ESM use*: From the employers' perspective, since employee behaviour can be affected by ESMs both positively and negatively, there needs to be a closer examination of how human resource policies and practices and other control mechanisms can intervene to ensure the best outcomes of ESM use and reduce negative results. Such research would provide guidance for employers to make the most of ESMs.

3) *Examine collective identity in ESMs*: It is unclear how ESMs, virtual spaces with employers' regular access and even monitoring, can foster a shared worker identity and whether this identity would differ from an identity in another virtual space. A finer-grained understanding of what kind of identities (if any) are shaped in ESMs could shed light on the role of ESMs in the landscape of digital worker collectives: can they facilitate or replace worker organizing in contemporary workplaces?

4. Policy Implications

Based on our analysis of the four themes in the literature, we propose the following policy implications for the various stakeholders.

1) *Trade Unions*. It is not clear whether digital technologies *per se* represent a solution for the decline of trade unions. Rather, unions' strategic choices determine the effectiveness of leveraging the potential and taming the dark side of digital technologies. However, the identification of effective strategies may require a trial-and-error process, along with the investment of a variety of resources. Cross-union exchange of experiences in deploying digital technologies for different purposes (organizing new groups of workers such as gig workers, renewing membership, or mobilizing collective actions) would help develop shared knowledge and a skill pool to maximize the efficacy of digital tools and communities. Upper levels of unions, such as union federations, should take the lead in organizing forums for such exchanges.

2) *Organizations*. Given the evidence of performance and innovation benefits of enterprise social media and virtual communities of practice, organizations should encourage peer-to-peer

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interactions in these virtual spaces to share, circulate, and stimulate knowledge and ideas. Meanwhile, organizations can be the target of digital unionism and digital labour activism cultivated by online communities. We encourage organizations to make use of digital platforms as channels for collective and individual voices to improve workplace democracy and cultivate healthy employment and labour relations. We advise against using digital capacities to monitor and suppress voices.

3) *The State*. The state has been a main actor in industrial relations, as a public employer and a rule-setter who determines working conditions for workers and delineates frameworks within which other actors function. However, online worker collectives are not yet covered by employment relations legislation. While online worker collectives are *de facto* becoming relevant actors in employment relations, there is a vacuum in state legislation regulating the formation of these collectives. The state should consider legislating online worker collectives, protect their rights, and perhaps also limit their power to create a balanced industrial relations system.

4) *Labour-Oriented Civil Organizations*. Participatory and aggregate opportunities enabled by new digital technologies have empowered civil organizations who seek to improve labour rights and working conditions, making them and the movements they mobilize increasingly relevant in contemporary employment relations. These organizations should leverage their digital capabilities to develop and, more importantly, to sustain a dense network to help them continue to mobilize to achieve better labour rights. The main issue for these organizations is effective organizing and management to avoid the fate of short-lived mobilizing actions and remain relevant actors in the system.

5. Conclusion

In this project, we reviewed 193 published articles from management, sociology, and industrial relations to synthesize the extant knowledge on worker collectives in digital spaces and suggest directions for future research.

The accelerating digitalization of employment dynamics has facilitated the emergence of a scattered workplace and created a trend of asociality, undermining the foundations of traditional worker collectives. At the same time, digital technologies have created new opportunities for workers to connect and form groups. In this review, we identified four themes in the literature on digital worker collectives: collectives for digital workers, the digitalization of unions and other labour organizations, digital communities of practice, and enterprise social media. For each of

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those themes, we discussed emerging findings and proposed future research directions to validate current evidence, refine insights, and fill knowledge gaps.

Our synthesis refutes techno-determinism by concluding digital technologies *per se* do not harm or promote worker collectives. Instead, they generate a new set of constraints and opportunities. The capabilities and strategic choices of employment relations actors – the state, employers, workers, trade unions, and other civil organizations – determine the roles of digital technologies and digital worker collectives in contemporary employment relations and the outcomes for all parties. Overall, our analysis calls for more investigation into the digital capabilities and strategic choices of different actors, as well as their interactions.

6. Knowledge Mobilization

We will strive for the knowledge we produced on worker collectives in the digital space to have a significant impact by exchanging our findings with fellow academics and relevant stakeholders in practice.

6.1 Knowledge mobilization within academia

Academic conferences represent a main channel to communicate our findings within academia and crosspollinate future research to advance knowledge in this area. We will participate in two major conferences in industrial relations in 2023: *Canadian Industrial Relations Association (CIRA) 2023* and *Labour and Employment Relations Association (LERA) conference*. We will contact fellow academics in the LERA community who are interested in related topics (digitalizing workplaces, changing nature of unions) to organize a focused discussion and share new insights.

Journal submission. Our knowledge synthesis report will be the foundation of a systematic literature review article we will submit to a top-tier academic journal (targeted journal: *British Journal of Industrial Relations*). This article will enhance industrial relations perspectives by combining management, sociology, and communication insights to systematically summarize various factors influencing the formation of digital worker collectives. It will also present an agenda for future research on worker organizations in the digital age. We aim to complete this manuscript by fall 2023.

Student development. This knowledge synthesis report will lay the foundation for future empirical investigations by the two students collaborating with Professors Yao and Frangi, including theses and dissertations. This report will be also circulated in summer 2023 to interested

colleagues at University of Ottawa, UQAM, and other universities in Canada and beyond. The report will be accompanied by targeted pedagogical notes on how to leverage it for undergraduate and graduate teaching in various disciplines. The possibility of developing some short, pedagogic videos may be explored with interested professors.

6.2 Knowledge mobilization to practitioners

This report will be circulated to union confederations and federations, human resource practitioner associations, and policymakers. Based on their interest, we will plan joint seminars in which we highlight practical and policy implications of our findings. We will explore the possibility of developing short videos, targeted to a specific practitioner population (e.g., human resource practitioners in big companies, union stewards), and then disseminate these videos through their websites.

6.3 Knowledge mobilization at large

Finally, a *lay-language article* (in English and French versions) will be written for publication on various websites. It will be published on Telfer Knowledge Hub, the website of Telfer School of Management, and on “Innover par la recherche,” the website of ESG UQAM. It will be also circulated through several social media sites (e.g., Twitter, LinkedIn), trying to attract journalists, thinktanks, practitioners, and academics with large follower bases. The article will be ready in March 2023.

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