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## Introduction to special issue on digitalization, labour and global production

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## Abstract

This special issue contributes to the emerging literature on digitalization and its impact on work and workers in global systems of production. Three key themes are featured in the collection of papers. They are on the relationship between the use of digital communication technologies and power relationships, working conditions of online workers or crowdworkers, and shifting geographies of production. The papers also largely focus on the global South, contributing to research on digitalization and labour which has thus far tended to examine large and higher income countries mainly in the global North. This introductory article expands on and situates the papers broadly within the literature on digitalization and labour and within the three themes more specifically, and discusses their implications for future research.

## Keywords

Digitalization, labour, workers, global value chains, power, crowdwork, production

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## Introduction

Digitalization is a phenomenon that affects virtually every process in the global economy today. Much of this discussion is focused on industry and firms whether it be the increased use of digital technology in the manufacturing of products and the promises of Industry 4.0 (Brynjolfsson and McAfee, 2014) or the outsourcing of services through online platforms, for example through crowdwork and the gig economy (Ilsøe, 2017; Körfer and Röthig, 2017). We also know that digital technologies are profoundly impacting the ways in which corporations manage production, work and employment relations within global value chains (GVCs). For example, lead firms are able to outsource more of their production of goods and services with the help of sophisticated software that can digitally track the inputs and outputs in the management of GVCs (Azmeah and Nadvi, 2014). In addition to monitoring production, lead firms are able to use digital tools to also track working hours in real time of suppliers across multiple locations (Barnes et al., 2015). This occurs also in response to increased pressures, either through regulation or public campaigns, for more transparency over labour conditions and violations in GVCs (Cherry, 2016; Zajak and Scheper, 2019). Smart factories, moreover, allow managers to electronically track individual workers and how long it takes a worker to finish a process on a particular product. Such digitalized worker management methods are also increasingly being applied in offices, contributing to an uberization of work beyond the offline gig economy. The implications on work and workers are bodily surveillance and micro-management and equipping managers with more power to discipline (De Stefano, 2016; Lee, 2018; Phoebe 2018).

These discussions tend to lose site of the impacts digitalization can have on the less visible, yet fundamental, actors which make global production systems function – workers at the bottom of GVCs that are predominantly located in the global South. Moreover, when considered, workers are often pitted against the advancements of digital technologies as the losers in a battle over job losses, for example, due to automation. In its 2019 World Development Report, the World Bank's policy recommendations included lowering worker protection regulations to prepare for a future of work where workers are predicted to be more expensive than technology. When digitalization is discussed in the context of development, digital technologies are often portrayed as a solution to key developmental problems such as increased integration into world markets, employment growth, and freedom and flexibility for workers (World Bank, 2016). These debates often do not consider other important implications for workers, such as new modes of worker exploitation, and increasing precarization and vulnerability (Bergvall-Kåreborn and Howcroft, 2014). More critically, they do not adequately consider the perspective and context of digitalization and workers in the global South (see Berg, 2016 for an exception). As part of this broader discourse, the view of workers having a low degree of bargaining power in the face of a fast-moving trajectory of digital technological advancement is certainly a reality for most workers. However, a closer look at how workers, trade unions and civil society organizations use digital communication technologies and social media in creative and strategic ways to try to counter the power of firms and the state in their fight for better working conditions, for example, point to how digitalization can also be on the side of workers. There is currently a lack of knowledge and understanding on how digital tools are used for networking, mobilization and organization – an area which is only beginning to be explored in research on industrial relations, albeit with a focus on formal institutions in the

global North (Degryse, 2016; Huws, 2014; Valenduc, 2016). The papers in this special issue fill this gap in the literature.

The collection of papers in this special issue is empirically and theoretically rich and contributes to research on digitalization, labour and global production in three ways. First, discussion and debates on digitalization tend to focus on countries in the global North and middle-income countries pursuing digitalization as industrial policies. Much of the research on digitalization thus far has taken on a national perspective and largely conducted in advanced economies such as the European Union and Germany and digital newcomers such as China (Arntz et al., 2016; Frey and Osborne, 2013; Hirsch-Kreinsen, 2016). From an empirical perspective, acknowledging that much of the discussion of digitalization has focused on developed countries, we have specifically aimed for a greater focus on the situations and outcomes for workers in the global South among the various papers. Second, despite digitalization being a global phenomenon that depends on platforms which operate across borders, the literature on digitalization and labour rarely applies a transnational perspective. This is where this special issue makes a distinct contribution to the literature by focusing on the cross-national processes, connections and interdependencies of the outcomes of digitalization on production, work and workers. Third, the special issue contributes to this transnational lens through an inter-disciplinary approach. The conceptual and theoretical diversity across the papers, which include GVC analysis, development studies, economic geography and labour sociology, helps us understand the transnational impacts of digitalization on labour in the global economy from different angles and perspectives. The interdisciplinarity of the papers provides for a wider lens of analysis across a range of digital processes, at various scales, and across different sets of actor relationships.

The six papers engage with three important themes regarding the impact of digitalization on labour and global production. They are the relationship between digital technologies and (1) power relationships, (2) working conditions of online workers or crowdworkers and (3) shifting geographies of production. Broadly, these themes contribute to debates surrounding wider questions on the impact of digitalization on socio-economic developmental outcomes for countries, communities and workers.

On the theme of the effects of digital technology on power relationships, the first three papers by Helmerich, Raj-Reichert and Zajak; Hartmann, Dannenberg and Nduru; and Gerber explore how and to what extent digital connectivity among workers and suppliers in developing country locations challenge power relationships among different actors in GVCs. The first two papers examine the use of low-level or early generation digital communication technologies by workers and farmers (respectively) to connect and exercise different modes of power vis-à-vis lead firm and state actors in order to improve their own working conditions and economic benefits from participating in the chain. As lower level digital technology is most available for users in less developed countries, the special issue begins with what may be a counter-image of digitalization as a futuristic world of robots and artificial intelligence (which the final paper addresses). The papers in this first theme also point towards the unequal distribution of access to certain digital tools and the unequal playing field in current and future struggles around working conditions in the global digital economy.

Helmerich, Raj-Reichert and Zajak analyze different modes of collective worker power through the use of digital tools to improve working conditions in GVCs. They widen the concepts of worker power in GVC research by utilizing power resource theories of

(transnational) networked power and associational power and their enhancement and exercised through simple digital communication technologies. Broadening the conceptual lens on worker power is important for research on GVCs because different governance forms, particularly captive GVCs such as garments and footwear, can severely limit the exercise of structural power by workers and tend to be located in production locations whose political environments deter or prevent their exercise of associational power. The authors capture the realities of labour organizing and contestation in GVCs which increasingly involve transnational connections and processes (Lohmeyer et al., 2018), which they show were established, maintained and deepened through the use of digital technologies. Two case studies are discussed to analyze how workers collectively organized to pressure lead firms and governments to improve working conditions. The first case study, on female workers in garment factories in Honduras, showed the exercise of networked power using simple digital communication tools, such as email and Skype, tied to the scaling up of old offline networks of domestic and transnational alliances between workers, trade unions and nongovernmental organizations. The second case study, on workers in a footwear factory in China, showed how digital connectedness of thousands of workers using an online information sharing app was used to exercise associational power to mobilize a strike in a highly repressive state environment, and made it possible for workers to connect with external labour rights organizations (albeit temporarily) for information that led to coordinated bargaining demands. The findings illustrate how digital tools can lead to different forms of empowerment for actors which are normally considered weaker agents in GVCs.

Hartmann, Dannenberg and Nduru analyze the impact of digital technologies on power relationships among another set of actors at the inter-firm level – foreign buyers and producers (smallholder farmers) in Kenya participating in export-oriented captive agriculture (horticulture) GVCs. The authors ask the question whether increased use of smartphones and changes to knowledge gathering and sharing through digital connectivity via the Internet affects power relationships at the inter-firm levels of coordination. Their paper is largely situated in and challenges some of the Information and Communications Technologies (ICT) for development (ICT4D) debates that winners would be lead firms who possess and guard technological tools and advancements and losers would be suppliers who lack access and are unable to use and benefit from technological development. The authors, by comparing changes among smallholder farmers who switched from analog mobile phones to smartphones, discussed their findings related to two key processes which affected power relationships between the smallholders and their buyers. The first significant change was increased horizontal knowledge sharing and cooperation among smallholders as a result of online multilateral or group platforms within the region. This allowed smallholders to bypass gatekeepers of knowledge which operate within traditional vertical or a top-down manner in GVCs. These new opportunities for exchange provided smallholders with abilities to digitally market and sell their produce to alternative domestic markets. As a result of these new alternative markets, farmers were able to functionally upgrade within regional value chains which the authors concluded led to their economic empowerment. This resulted in increasing the bargaining power of smallholder farmers who in traditional captive value chains are dependent on markets created by lead firms abroad. This finding shows the emancipatory possibilities of digital tools in this case for smallholders – actors normally considered weak in GVCs. The second key finding was that buyers or lead firms in the GVCs did not increase their control, for example by adopting digital practices of monitoring, over smallholders. This finding counters the ‘dark-side’ arguments that

digitalization will automatically lead to increased power by lead firms over weaker suppliers in GVCs.

Switching focus to the anonymous, invisible and isolated online or crowdworker, Gerber investigates algorithmic management techniques, as novel methods in the organization of work, to understand the power relationships between crowdworkers and platform managers and their impact on individual worker empowerment. The paper offers a deep exploration of technological and organizational practices of community building online within the broader debates on digitalization and labour in the global economy. Counter to the portrayal of crowdwork platforms as autonomous modes of work void of managerial oversight, Gerber illustrates that platforms exhibit far more complex managerial methods through algorithms. Building on a rich set of interview data of crowdworkers across different online platforms and content analysis of online community spaces of five platforms in developed countries, Gerber's findings show that these community spaces, where workers interact with each other or with platform managers, are governed by different algorithmic management techniques depending on the type of tasks. Online communities in high-skilled macro-task platforms were loosely managed, with minimal control and intervention by platform organizers in order to foster creativity among the high-skilled workers via online interactions. In contrast, online communities for low-skilled micro-task platforms were more controlled with little opportunity for crowdworkers to interact with each other. This, Gerber argued, was done to curb 'irresponsible autonomy' or worker resistance. Moreover, Gerber finds the design of community spaces as forms of indirect control via 'community engineering' whereby workers used these spaces individually to cope with their negative work experiences and thereby minimizing contestation and conflict. Therefore, these spaces did not become vehicles for building collective worker power. Rather, they were designed as instruments of self-regulation and self-disciplining, turning workers into self-managers.

Gerber's paper introduces us to the growing world of work online which has materially expanded to the global South and taken up a policy discourse of generating employment and income for positive developmental outcomes. The next two papers in the special issue challenge these ideas and set out to show through strong empirical evidence on the lived realities of crowdworkers in different locations in the global South. Rani and Furrer, like Gerber, also focus on algorithmic management techniques and their effects on workers, which is tied more broadly to developmental debates. Looking closely at the rating and reputation systems of platforms as algocratic management techniques, the authors show their negative impacts on worker participation, remuneration and work-time intensity. The authors also address a gap in research on crowdwork by focusing on short-term or microtask digital platforms performed by workers in the global South. Based on an extensive ILO survey of crowdworkers across different regions, results showed various adverse impacts to workers and their working conditions. They included lower pay, high number of working hours or hours searching for jobs, and no recourse to remedy for wrongdoing by employers (which they cannot see or communicate with). The authors point to the role of algorithmic designs, using the conceptual ideas of algocratic control (Aneesh, 2009), leading to low pay and discriminatory exclusion of particular developing country regions. With these findings, the authors in a similar vein to the following paper by Anwar and Graham disagree with the claim of digital jobs in the 'gig' economy as flexible and entrepreneurial for all workers. More broadly from a development context, the paper challenges the idea that online platforms create favourable jobs in countries with high unemployment in the global South. While jobs may increase in numbers, the more important question is

their quality and with what contribution to the overall welfare of people, communities and the development of countries. Here, Rani and FÜRrer point to the fact that low-skilled microtask crowdwork is largely done by higher skilled workers who do not receive higher wages and whose skills are under-utilized. These effects have a broader implication for what role the rise of online platform work can have for development outcomes in the global South.

Staying with the concern for the developmental impacts of the online gig economy often couched in the discourse of increased opportunities for workers to join the marketplace, Anwar and Graham narrow down on this discussion of crowd-workers' experiences by focusing on Upwork – the largest online freelancer platform (Carrel-Billiard, 2017) – and crowdworkers in different countries in Sub-Saharan Africa. The authors specifically examine the effects on lives and livelihoods and draw on extensive fieldwork research in South Africa, Kenya, Nigeria, Ghana and Uganda. They find that the promised 'freedom' and 'flexibility', often used by international agencies such as the World Bank to promote gig work, actually leads to 'precarity' and 'vulnerability' of the workers involved. Unpredictable contract cancellation or constant monitoring of all workers contributes towards work-related stress, loneliness and social isolation, high work intensity, non-payment of wages, and unfair dismissals. While platform work is an important alternative to unemployment in Africa, the authors argue that these jobs are also symbolic of deteriorating working conditions for a workforce that is already structurally constrained by their weakened bargaining power in a market with an oversupply of labour. This paper delivers important insights into the largely under-researched practices and real-life consequences of gig work in Africa.

The potential of digitalization for developmental outcomes depends on where regionally and what kind of technologies and advancements are located. This is determined by the interaction between industrial, technological and policy changes. Focusing on this bigger picture question, the final paper closes the special issue with a sobering theoretical exploration of the effects of digitalization on the geographies of production. Butollo examines how new digital technologies, such as artificial intelligence and automation, affect the geographies of manufacturing in GVCs. The paper discusses the dynamics of (re)shaping the global division of labour as a response to the digitalization of global production networks. The paper counters the argument that progress in automation technologies in manufacturing will lead to the reshoring of production back to the home country of multinational corporations. According to Butollo, reshoring to serve fast-responsive consumer markets in the global North will not take place due to different digitalization technologies and pathways in high-wage countries versus low-wage countries. He argues that automation will have a small impact on high-wage countries since their key industries, for example the automobile industry, are already heavily automated. The effects of automation therefore will have a greater effect on lower-wage countries where current manufacturing processes can benefit from utilizing automation equipment for 'catch-up innovation'. Further, digital technologies are also leading to better and faster integrated logistics networks and a further modularization of value chains, through the rise of platforms, which drives more regional concentrations of production near large end markets rather than widespread global fragmentation. The implications of this theoretical analysis have a wider resonance to discussions on what outcomes new digital technologies will have for social and economic upgrading in the global South (Sturgeon, 2019).

## Conclusion and implications for future research

This special issue embarked to bring together novel insights into digitalization and labour in the context of global production with an emphasis on the global South. The articles looked at different types and processes of digitalization, different practices and tools from various theoretical and methodological angles in order to explore the reconfiguration of power relations and its implications for workers and their working and living conditions at the bottom end of GVCs. Each article makes a stand-alone contribution to the literature on digitalization in the global economy, but taken together we can draw three conclusions which can inform future research in this emerging field.

First, research on digitalization of labour and work in GVCs covers many facets and forms, which include but cannot be reduced to automation or algorithmic management. In addition, GVCs remain embedded in a range of contexts governed not only by different and overlapping labour regulations, but also by a variety of digitalization policies and practices. Future research needs to pay more attention to differences in pathways, speeds, logics and strategies of digitalization that co-exist within very narrow geographical spaces and within individual industries. The variety of digitalizations makes it difficult to draw generalized conclusions about the implications of digital technologies on different actors and processes in GVCs and in the global economy. Future research should aim to specify the dynamic conditions under which particular forms of digitalization lead to certain outcomes, such as socio-economic conditions, and for whom.

Second, the contributions showed that worker power is affected by digital technologies in multiple ways. Workers are not only passive actors, who become increasingly replaced, controlled or governed through algorithms, but they also explore new ways and counter strategies to re-construct their power under changing conditions. Still, exploring new forms of worker power takes place in a context where knowledge of, as well as access and resources to, digital technologies are unequally distributed, making it all the more important to study and learn from new strategies of (transnational) labour activism (see Brookes, 2019; Soul, 2019; Zajak et al., 2017). This includes understanding better cross-border digital organizing or networking and their limitations and failures in a world with increasing digital surveillance by firms and the state.

Third, the contributions showed that single-sided pessimism or optimism is superficial and simplistic. The topic of digitalization of global production intersects with various issues, such as governance regimes and policies, and therefore cannot be narrowed down to one-dimensional outcomes such as an increase or decrease in employment opportunities. As the contributions in this special issue begin to show studies on digitalization, labour and global production need to take into account a variety of existing debates and literatures to better understand not only the realities and implications of digital technologies but also the degree of newness and transformative capacity of the phenomenon. An inter-disciplinary approach to future research is necessary to continue adequately uncovering and understanding these issues. There is a need for deeper understanding and knowledge of the opportunities and challenges digitalization and digital tools offer to inform policies and actions relevant to weaker actors in the global economy with limited resources and capacities – workers, trade unions, civil society, as well as governments in the global South – to become active agents in shaping digital policies and its politics.

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