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# The future of digital work: the challenge of inequality

Rajendra K. Bandi, Ranjini C R, Stefan Klein, Shirin Madon, and Eric Monteiro

## 1 Introduction

The worlds of work and organisation are increasingly being pervaded by digital technologies which provide opportunities to generate new sectors and work tasks, increase productivity and deliver effective public services but create many challenges for society. The COVID-19 crisis has caused the largest global digitalization experiment, forcing almost everyone to work, study or learn from home. On the optimistic side, the development of automation enabled by technologies including robotics and artificial intelligence brings the promise of higher productivity and economic growth. This is assumed to enable firms to scale up or down quickly thereby challenging traditional production patterns based on ownership of resources and blurring the boundaries between firms [8]. Digital platform firms adopt new business models that differ from traditional production processes based on input, process and output generating value instead by creating a network effect connecting customers, producers and providers while facilitating interactions in a multi-sided model. In order to trade goods and services on an online platform, individuals and firms need only a broadband connection, which offers economic opportunities also for small traders in developing countries. In terms of sectoral changes, digital technologies have shifted employment in different ways. In advanced economies, the past few decades have seen a decline in industrial employment and a shift from manufacturing to services. The trend in low-and-middle income countries has been different as the share of industrial employment primarily in manufacturing has remained stable and in some East Asian countries has risen. The World Bank [19] explains this trend as resulting from the falling cost of connectivity enabling emerging economies to produce more capital-intensive exports as well as due to increasing patterns of consumption of products and demand for new products as a result of rising incomes. In terms of skills, while the demand for less advanced skills that can be replaced by technology is declining, the demand for advanced cognitive skills, socio-behavioural aptitude needed to participate in global teams, and the ability to employ agile methods to maintain flexibility and adaptability to fast-changing demand is rising. While this trend has been evident for some time in developed countries, the same pattern is emerging in developing countries as the share of employment in high-skill occupations is rising [15].

In contrast, there are critical voices that express concerns about the future of digital work for business organisations, consumers, workers and individuals. Platformization has in many cases de facto led to monopolization, in line with a winner-takes-it all logic of network effects. Many SMEs are forced to trade on platforms in order to not lose out, yet they have become easy prey to the monopolistic platform providers. For consumers we observe two effects: on the one side they benefit from allocation efficiencies

(for instance, transparency, low transaction costs) the platforms provide, yet on the other side they are subjected to value extraction [4] as their digital traces are collected, analysed and monetized by the platform, who claim ownership of their customers' data [21]. For workers, this raises challenging issues of division of labour between the human and the machine - the algorithm. While automation and replacement of human labour is happening in some areas, the majority of cases, however, point towards various forms of transformation of work and symbiotic agency [7]. Lessons learnt from the productivity paradox or the digital divide decades ago revealed how it is the interwoven character of labour, technology and work processes that leads to productivity gains. However, new institutional responses such as globally-distributed teams which have emerged bring uncertainties as a result of geographical and temporal distance as a result of how dispersed teams are configured and the diversity of workers [6]. From the perspective of workers, two-thirds of people living in advanced economies are anxious about the sweeping impact of technology on employment [5]. A main cause for anxiety is identified to be related to rising inequality compounded by the advent of the gig economy in which organisations contract with independent workers for short-term work that encourages a race to the bottom in working conditions. There has been a rapid increase in the number of companies with zero employees where individuals provide services through some form of independent contractual relationship with firms. This type of work which responds to the increasing call for a range of on-demand services like food delivery and transportation could account for millions of workers within a few years. While bringing flexibility, this perceived advantage is indeed a double-edge sword. Despite offering workers diverse income sources and ability to control work schedules, gig economy platforms have been criticised for being unpredictable and associated with poor wages and work conditions, particularly in the context of developing countries where informality characterises a large set of economic activities [18]. Large corporations such as RyanAir have adopted a similar approach by designing freelance contracts for pilots. Google, Facebook and Twitter have created (at least) two tier employment models, with loads of perks at the high end and dismal working conditions of individuals employed by outsourcing operators, portrayed in the documentary *The Cleaners*<sup>1</sup>. Those workers and their dismal working conditions are hidden by non-disclosure agreements, they become invisible and are seen and treated as non-persons [13].

Of essence with these critiques is the fundamental argument about how digital technologies are diminishing the value of labour in society. Digital technologies have enabled the rise of tech titans, which do not hesitate to use their monopoly power to further their businesses<sup>2</sup>, they also make it their business to undermine antitrust regulation, privacy protection and social/ welfare protection under the umbrella of digital disruption [10]. As several scholars have argued, transaction platforms established to mediate work such as Uber, Upwork and Deliveroo treat labour as a commodity that can be bought rather than human capital that is socially-embedded within networks of inter-

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<sup>1</sup> <https://www.theverge.com/2018/1/21/16916380/sundance-2018-the-cleaners-movie-review-facebook-google-twitter>

<sup>2</sup> <https://www.theverge.com/2020/7/29/21335706/antitrust-hearing-highlights-facebook-google-amazon-apple-congress-testimony>

personal trust and safeguarded by state policies and legal frameworks [2, 20]. Uber has worked relentlessly to defend their claim that their drivers are not their employees, who would be eligible for protection guaranteed by labour laws, but merely as “consumers” of “algorithmic technology” [11]. A claim, which has been refuted by the European Court of Justice<sup>3</sup> and lately in California<sup>4</sup>.

As digital technologies become ever-more pervasive in organisational life and work, they are serving to reconfigure the relationship between time, space and place. There is growing realisation of a reconfiguring of time and space as the separation of work-life and home life is becoming indistinct. Information systems enable work to occur anywhere and anytime. This reconfiguration of space and time is frequently seen as a source of freedom, entrepreneurial opportunity and escape from organisational controls and structures. However, discussions about the interpenetration of professional activities and duties into the private sphere have so far been lacking [1]. [9] have collected cases of algorithmically supported work which show a profound loss in work life quality. Moreover, one person’s freedom from time or space constraints by enabling work to be done anywhere and anytime may become another person’s constraint as home life is invaded with work considerations. Digital technologies also reconfigure the relationship between space and place in the workplace environment. IT-enabled globalization has resulted in a transfer of knowledge about operations from the place of work into the space of managers who take decisions about how best to organise production work based on global standards ([12]. At the same time, work-related changes brought about by digital technologies in peripheral locations can only take hold if they mesh with the practices, tactics, local contextual factors and human motivation that occur within local workplace situations. Herein lies the crucial insight that despite the proclaimed, potential benefits of digitalization, the realization of these possibilities comes only with considerable attention to local situations, resources and circumstances. Hence, a constant process of reformation takes place at local level as social actors validate new work spaces introduced as a result of technology deployment in sectors as disparate as banking, public service delivery and healthcare. As digital technologies enable labour to become increasingly commodified and traded across the world, this reconfiguration of work and organisations tends to be biased against place, labour and tradition. Technology hubs and online work centres tend to be located in urban centres encouraging investment by policy makers in infrastructure such as roads and transport while neglecting to support more traditional sectors such as agriculture, artisanal industry and primary healthcare.

Eventually, the future of digital work and the challenge of inequality that emerges holds important implications for public policy. New digital forms of industrial organization raise critical issues in the areas of privacy, competition and taxation as the virtual nature of productive assets prevents the ability of governments to raise revenues. The contemporary phenomenon of smart cities across the world raises important issues

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<sup>3</sup> <https://www.nytimes.com/2017/12/20/business/uber-europe-ecj.html>

<sup>4</sup> <https://thehill.com/policy/transportation/512137-california-ruling-against-uber-lyft-threatens-to-upend-gig-economy>

about privacy as digital infrastructure is used to monitor and steer aspects such as tracking movements of residents and visitors, energy usage, and estimating neighborhood sentiment. [17] studies Rotterdam's smart city initiative raising issues of who has legitimate access to data, which data should be in the public domain and what are appropriate privacy frameworks to put in place to support the changing nature of city governance. The importance of policies to regulate competition and taxation surfaces as another public policy concern. The case of Uber, as revealed in a study by [14], demonstrates how government policy in Germany and Sweden supported the operating of Uber so long as it respected national laws on licensing and taxation. With the gig economy occupying ever-greater presence, the payroll-based insurance model is increasingly challenged by working arrangements outside standard employment contracts calling for new ways of protecting people's jobs. In recent years, the ILO [3] has been conducting surveys of crowd-workers to gauge their overall levels of vulnerability and make recommendations for introducing international public policy measures to improve their income security. In the context of low-and-middle income countries, the lack of quality private sector jobs leaves talented young individuals with few pathways to wage employment [16]. This requires the creation by the government of formal jobs to seize the benefits of technological change and better learning opportunities to enable those who have left school to reskill according to changing labour market demands. In many developing countries, however, despite open trade and improvements in business regulatory environment most workers remain in low-productivity employment often in the informal sector with little access to technology. Government investment in hard and soft infrastructure is also needed to ensure that the 'value' generated from digital technologies in the workplace is equitably distributed. Most obvious is investment in affordable access to the internet for those who remain unconnected. Equally important is government investment in roads, transport and the built environment which supports organisations to exploit new technologies. Finally, addressing the challenge of inequality requires huge investment to improve human capital outcomes of basic schooling and primary healthcare which are currently sub-optimal. In sum, public policy needs to be geared towards broad, infrastructural capacity boosting, not different from other investments in public good.

The IFIP Working Groups 8.2, 9.1 and 9.4 have a long history of supplementing the dominant technology-push accounts of digitalization with socially informed ones. This joint conference brings together these three groups for the much-needed analysis of the social pre-conditions, engagement and consequences of digitalization visibility. They have a tradition to highlight that the negative consequences of technology are not inevitable (deterministic) but typically the result of human intent and design. A critical assessment of the price societies are paying for the dark side of digitalization is called for as much as a reconsideration of societal values that are worthwhile to protect. This implies to ask what type of world we, people all over the world including future generations, would like to live in. With increasingly vocal proclamations of the consequences of digitalisation, there is a need for socially informed analysis of the uptake of digitalisation for work and everyday life in the manner traditionally promoted by all three of the IFIP working groups. The conference seeks to stimulate and encourage critical dis-

cussion of potential shifts in the changing world of work, organisations and its implications in the developing world. This conference seeks to open a space for the exploration of the ethics and politics of information systems in contemporary work and organisation and stimulate critical discussion about their implications for individuals, organisations and society at large. As a joint conference that combines three different working groups together, our overall goal has been developmental and inclusive in order to enable the nurturing of ideas, critical engagement with issues and eventual discussion of emerging topics that intersect the interests of the three working groups. The theme of the conference is particularly appropriate within the current extraordinary context of COVID-19 in which organisations around the world are having to adapt to new ways of working in order to continue functioning through the use of digital artefacts. The organisation of this IFIP Joint Working Conference has, in turn, also had to adapt to preparing for and running the conference in an online mode. Over the course of the past few months, the pandemic has resulted in disruptions to many academics as a result of health concerns, difficulties in travelling, adhering to quarantine procedures and the stress of uncertainties in terms of planning for the future affecting the submission of articles.

The proceedings in this volume include 22 full research papers. For the purpose of overview, the papers may be seen to fall into the following broad set of themes (although, of course, more often than not really cutting across several themes):

**Innovation and entrepreneurship:** Influenced by a Schumpeterian approach to innovation, this set of papers forefront the generative potential of digital technologies to offer new services but also ways of organizing their offerings. New opportunities for entrepreneurial activities and actors emerge but these should not obscure the role that humans play as intermediaries in promoting trust in business activities.

**The social significance of digital platforms:** Digital platforms and their associated ecosystem is a novel organisational phenomenon that reshapes the nature of service work and, not the least, the relationships between implicated actors in the ecosystem. Of paramount importance is the need to capture the attitudes and experiences of digital workers in order to improve understanding of how digital platforms impact lives, communities and society.

**Transforming healthcare:** With healthcare, especially in resource-scarce regions and countries of the world, constituting an essential service aspiring to reach all corners of society, the scope - potentially - for digital technologies to enhance quality, efficiency and coverage is significant. At the same time, limitations of technology deployment need to be addressed related to the wider contextual realities and structural impediments that shape health outcome.

**Implications for policy:** The role of governmental and public interventions to provide the resources and infrastructure for the broad spectre of digital technologies in society

is crucial yet under-specified. In particular, power and other social forces through various actors and networks play an important role in contributing to how public value is derived from such innovation.

**The dark side of digitalisation:** A characteristic aspect of all contributions to all three of our IFIP working groups is their critical perspective. However, we have here collected together papers which make the critical agenda more explicit.

In addition to the full research papers, the conference has two panels.

**Panel on AI in healthcare:** Once thought as a futuristic threat to humankind, Artificial intelligence (AI) is now part of everyday life. AI applications are nearly in all spheres of human activity from the banal to the fantastic, from mundane smartphone apps to controversial autonomous weapons, from playing chess to sports reporting, on the road as self-driving cars or in the ICU assisting in surgeries. AI is projected to have an unprecedented impact on the future of work, governance, warfare, education, medicine, and overall, the way we live.

The COVID-19 pandemic has highlighted the importance of the inter-connections of health systems and technological innovation. AI's most powerful use is to enhance human capabilities and not replace them. Three main areas in which AI is expected to contribute in healthcare are AI-powered predictive care, networked and connected care and in improving patient and provider experiences. This panel will focus on the application of AI-based interventions in healthcare, both in the public and private sector. The aim is to understand how AI is being used in healthcare, how could it be used in the near future and what are the ethical, social, policy and implementation challenges that these current and prospective uses present for work. The panelists will be drawn from a wide range of expertise including clinical, technical, private sector, public sector, non-government and academia who will describe the unique opportunities and challenges for AI and digital health in India. Apart from analysing the current trends, they will share their particular experiences and describe their success stories. For example, one of the panelists will describe the 'people first, technology last' inclusive approach that they adopted to reverse the paradigm and convince policymakers while implementing a malnutrition programme in childcare centres.

**Panel on Delivery of Digital services to the citizens:** Delivery of digital services has never been more important than during the current COVID-19 pandemic times, with two phrases 'social distancing' and 'contactless delivery' dominating the public discourse.

Governments world-wide have made significant investments in the past couple of decades, in taking the government services to the citizens doorstep using digital technologies. These efforts have met with varying success based on a number of factors such as the e-governance readiness, extent of citizen's participation, prevailing digital divide, process reengineering of service delivery processes, and the appropriate mindset

required for digital transformation. The challenges in this have been studied and documented by researchers.

COVID-19, and lockdowns around the world, has pushed governments to turn to digital technologies to ensure business continuity and offer newer services, in differing ways and with varying success. Countries that had developed sound, dependable e-governance infrastructure, capabilities and policies are finding it easier to provide contactless digital services for citizens and businesses. On the other hand, countries that have a gap in their policies and IT capabilities are struggling to respond to the pandemic-imposed challenge.

Governments have been deploying a variety of technologies such as the development of contact tracing apps, usage of drones and robots, tele-medicine, making digital payments, use of AI and data analytics to analyse and to predict spread of COVID-19 etc. However, some of these initiatives have come under intense scrutiny for a wide variety of problems. Some of the issues raised include, widening the digital divide, violation of privacy of the citizens and ignoring the basic principles of privacy by design, creation of a surveillance state and having a blind faith in the technologies.

This panel will focus on the challenges and opportunities in designing and delivering digital services in general with particular emphasis on unexpected emergencies like the current Pandemic. The panellists will be a mix of senior government officers involved in e-governance initiatives and researchers who have been studying these developments.

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