STUDY

LABOUR AND SOCIAL JUSTICE

ECONOMIC RIGHTS IN A DATA-BASED SOCIETY

Collective Data Ownership, Workers' Rights, and the Role of the Public Sector

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Control over data and digital intelligence is the key ingredient of power in the emerging digital society, increasingly shaping the global economic, social and political order.

Widespread access to society's data – currently in the hands of a few digital corporations – is a precondition for a fair economy, quality public services, public policy-making and democratic governance. Asserting collective ownership rights over data is one of the most fundamental policy issues of our time.

Public sector workers and their unions will need to play an important part in shaping the role of public sector in a digital society – providing data and digital intelligence as public goods, ensuring the development of appropriate digital public institutions, and managing data infrastructures.

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Public Services International (PSI) is a Global Union Federation of more than 700 trade unions representing 30 million workers in 154 countries. We bring their voices to the UN, ILO, WHO and other regional and global organisations. We defend trade union and workers' rights and fight for universal access to quality public services.

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INTRODUCTION

The advent of a digital society is fundamentally transforming our social and economic relationships. Its impacts are so profound and rapid that policy-makers, and most other actors, are scrambling to find a way through it. Meanwhile, global digital corporations – largely US-based, with some from China now joining in – are dictating terms and shaping the default global socio-economic architecture for the new era, with very little direction being provided by public policy.

Two key areas of concern for public sector workers are: (1) what kind of deal the digital economy will mete out to workers, and (2) the very role of the public sector in the new digital context.

Workers' organisations have been most vocal when it comes to automation destroying jobs, and the »informalising« of work through its »platformisation«.[1] The impact of digital surveillance on workers' rights and their terms of employment has also caused concern.

Apprehension over the role of the public sector relates to outsourcing and privatisation of digital functions, increased reliance on public-private partnerships, and tax evasion by global digital corporations, all of which undermine state capacities and budgets.

Above and beyond these more familiar issues, this paper examines the fundamental changes that are taking place to economic structures, centred on the key digital economy resource of data. It then goes on to explore the implications of these changes for the public sector and its workers. Most of the aforementioned concerns voiced by workers' groups relate to phenomena visible on the surface of these deeper structural changes. An understanding of the latter is a precondition if these concerns are to be successfully addressed.

The first section discusses the nature of digital production and digital economy. The next one explores the political economy of the key resources in the digital economy – data, and digital intelligence derived from data. The third section looks at the public sector's legitimate role in the new digital context. The final section concludes the paper by listing important areas for engagement by public sector workers.

1 »Platformisation« denotes the use of digital platforms to re-organise economic activity in almost all sectors, like Uber does for transportation. The phenomenon has also been referred to as »Uberisation«.

2

THE NATURE OF DIGITAL ECONOMY

Some time will pass before the full import of the digital economy is realised. But its logic already pervades many, if not most, key changes taking place at present. To recognise this logic and prepare for the future, one must first understand some fundamental differences between the passing Industrial Age and the emerging digital society.

The Industrial Age dawned when machines, and their deployment in factories, became central elements in the economic structure of society. A machine is basically an embodiment of physical force and action. In the pre-industrial times, physical work was almost exclusively performed by humans or animals. This fundamental shift transformed not only the entire economy, but also our social, political and cultural systems, a story all too well known to warrant repetition.

Capital became characterised by ownership of machinery and factories, and workers by wage labour performed on machinery. The public sector's role, apart from the pre-industrial one of providing security and some very basic welfare, shifted to responsibility also for the large-scale infrastructure needed for industrialisation; both hard infrastructure, like electrical power, roads, railways and ports, and soft infrastructure, like education and banking. The public sector got directly involved in production, the extent of which varied by political ideology but was consistently high all over the world. The public sector also provided material and legal protection to weaker economic actors, like workers and farmers.

The initial basic value chain was raw material as input for factories which produced goods that were transported to markets all over the world. Factory owners led and controlled this value chain. This model changed significantly over the last half-century or so with intellectual property (IP) becoming more prominent than mechanical property. This gave rise to knowledge workers – some of whom earned close to what in an earlier era could only have been earned through ownership of capital – and outsourcing of manufacturing to developing countries. To a considerable extent, the new IP-based value chains have been made possible by information and communication technologies that facilitate remote supervision of production processes. There has been a contraction of the traditional role of public sector in production of knowledge, which underwent rapid privatisation. As developing countries vied to become outsourcing destinations, mostly based on labour arbitrage, they entered into a race to the bottom in rolling back workers' rights and protection. Structural adjustment programmes over this period drove public sector austerity, and its outright exit from many economic activities. A significant objective in all this has been to open up new markets in the South for global corporations of the North, which was also supported through trade agreements.

The digital shift being witnessed at present is much more fundamental. The CEO of Daimler, the German car manufacturer, stated in 2015 that he feared competition the most from Google and Apple (and not other car manufacturers). He cautioned that car manufacturers could become the Foxconns of the automobile industry (the Taiwanese company Foxconn manufactures phones for Apple). Google or Apple would be the »brain« in any car, which was the real thing.[2] The Chinese ride-hailing company Didi is helping design cars for Volkswagen because, after all, it holds so much crucial data relating to car usage.[3]

Traditional manufacturing and IP advantages increasingly reduce in importance as economic power shifts to whoever possesses a sector's key data. Such data is mostly in the hands of consumer-facing digital platforms.[4] These platforms are society's principal data mines, even more than being the space for interactions among economic actors of a sector that was their original business. The latter is necessary, however, in order to collect data, as interacting actors leave digital traces of their activities. This data is transformed into the digital economy's key capital good, digital intelligence (a term that includes all kinds of insights or intelligence derived from data, ranging from data analytics to advanced forms of artificial intelligence or AI). Digital intelligence is employed to closely control and significantly re-or-

2 https://www.patentlyapple.com/patently-apple/2015/09/daimler-ceo-rants-that-they-wont-be-the-foxconn-of-car-makers-for-apple.html

3 https://www.reuters.com/article/us-autoshow-beijing-vw-didi-exclusive/exclusive-volkswagen-in-talks-to-manage-didi-fleet-co-develop-self-driving-cars-idUSKBN1I10YP

4 Other points of the value chain also produce important data, like manufacturing data. Such data is most useful to the corresponding process itself, and not so much to the overall value chain. The most valuable data resource overall is social data collected by consumer-facing business entities.

ganise a sector's economic activities and interactions in a manner that is much more efficient than in the Industrial Age paradigm. It also enables entirely new intelligent products and services. Data and digital intelligence therefore represent an unprecedented productive force, like mechanisation did when it ushered in the Industrial Revolution.

It is this digital intelligence that the Daimler CEO referred to as the »brain« of a car, and it is what allows a ride-hailing company to advise long-established car-manufacturers on how to design cars. Google's original AI project was called Brain.[5] The Alibaba-backed smart city project for Kuala Lumpur is called City Brain.[6] »Brain« indeed is the most appropriate analogy; data-based digital companies are becoming the brain of every sector, controlling and reorganising them intelligently.

The core competency of Uber and Amazon is respectively to serve as the »brain« for the vast transportation and commerce ecology that they manage and control. For instance, it is obviously unintelligent for a cab to keep coming back to a taxi-stand after every trip or to take individual telephone bookings from customers likely to be miles away when one might be available right where an earlier trip is terminating, and perhaps the customer also wanting to go in the same direction that the cabbie had intended to head for. These »digital intelligence« or »brain« companies need not themselves own any physical assets, or run any physical operations; they may not even be in the same country where the physical activities related to a service take place. They are generally not all too concered about IP, either. They therefore represent a very new kind of dominant economic actors. These »intelligence corporations« are evidently beginning to lead the value chains in every sector.

It is estimated that, in ten years' time, Alphabet's autonomous car unit Waymo may be worth more than the combined value of Ford, General Motors, Fiat-Chrysler, Honda and the electric car-maker Tesla.[7] What Waymo does is merely order vehicles from Chrysler and Jaguar — effectively turning them into suppliers — and then equipping the vehicles with self-driving software and hardware built in-house.[8] It can be said to be installing the »brains« in these vehicles. The real game down the line is to have vast networks of autonomous cars run through centralised intelligence. Other elements of transportation would increasingly be brought into such an intelligent system, to virtually run the entire transportation sector.

Being the brain, or the central intelligence of a system, enables immense power to be exercised over every bit of the value chain. Amazon is rapidly developing so much digital intelligence about the products placed on its platforms by third-party sellers that – apart from organising market exchanges – it begins making and selling similar products of its own in a manner that out-competes the original suppliers. Innocuous looking food-delivery companies similarly – using their suppliers' data – set up their own ›manufacturing‹ through what is referred to as cloud kitchens.

Interestingly, it may not be the long term business vision of these »intelligence corporations« to extend themselves into low value physical functions. Their intention would be to focus on their core competence of data based digital intelligence and outsource most other activities, which is the normal way lead companies function in a value chain. Their current direct involvement with these physical functions appears to be disruptive; demonstrating and establishing alternative ways of managing these activities in a manner that is tightly integrated with the central »brain« or »intelligence« function that they themselves represent. Once such a new digital intelligence-led value chain model is demonstrated as much more efficient, various physical activities are expected to be again outsourced. But, at that stage, the manufacturers, traders and service providers concerned will be completely dependent on the lead company's digital intelligence for most of their activities, with correspondingly adverse terms of engagement. Their situation would more or less be comparable to what Uber drivers have been reduced to. It must be remembered how drivers were induced into the Uber system through many incentives, including much higher earning, made possible due to the new systemic efficiencies of a digital intelligence-run system. However, once the system became mature, and drivers' dependency complete, the earnings have been falling steeply.[9]

If the Industrial Revolution represented disembodiment of physical power from humans and animals to machines, the digital revolution for the first time systematically disembodies intelligence to machines. The Industrial Revolution resulted in mass production; the digital revolution centres on intelligent production. Intelligence is not just about what is to be applied where, when and how, like matching buyers and sellers in e-commerce, or application of agri-inputs in precision agriculture; intelligence also gets embedded in products and services themselves, like in intelligent cars and smart refrigerators. As digital intelligence is networked across many activities, products/services and actors, it begins to be employed to control and re-organise the entire economic sector concerned. The greatest economic power therefore comes to be in the hands of those actors who have the data, and are able to convert it into digital intelligence. This is what makes the digital economy a fundamentally new and different kind of economy.

The digital economy paradigm has far-reaching impacts in areas that are traditionally dominated by the public sector.

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5 https://ai.google/research/teams/brain/

6 https://www.opengovasia.com/malaysia-city-brain-initiative-to-use-real-time-anonymised-traffic-data-from-grab/

7 https://www.ft.com/content/dc111194-2313-11e9-b329-c7e6ceb5ffdf

8 Ibid.

9 https://www.thenewsminute.com/article/no-easy-exit-ola-and-uber-drivers-india-face-spiralling-debt-trap-102558

Google possesses the most important geo-spatial and city traffic data, and many other forms of data relevant to the transportation sector. It has been discussing with city governments in the US to practically take over entire city transportation operations, including diverting subsidies from public transport to ride-sharing companies.[10] Huge privately developed and managed »intelligent education« initiatives in China with AI-based, individualised learning threaten to upend the teacher-and-classroom-centred education paradigm.[11] The health sector is currently doctor-centric in terms of the first point of contact with the patient. Very soon the first trigger for a health intervention will come from wearable data devices, like smart watches. A second line of physical tests may also be automatically arranged – and even preliminary medicines prescribed, before the data company advices and makes a doctor's appointment.[12] Health data collected by these data companies will also be crucial to the development of medicines and medical equipment. Google's plan is to build cities' Internet-up, where intelligent data-based systems run every single aspect of the city, of course under the company's supervision.[13]

Such fundamental changes will manifest in every sector of the economy, more quickly than most people expect, as generally happens with all things digital. It is important for public sector workers to understand and anticipate such seismic shifts, and craft their strategies accordingly, even as they address specific, immediately visible changes.

If factory and open market were the Industrial Age's central economic institutions, in a digital society it is the digital platform. Platforms embody the digital economy's key capital good, digital intelligence, which enables intelligent production – of goods as well as services. Platform companies do not so much operate in the market as they replace and re-materialise it.[14] Platforms are in fact post-market, because markets are primarily based on open-price-based exchanges, and price signals that significantly determine supply and demand. Platforms are supplanting open pricing to intelligently set the contextually ›best‹ terms of exchange at any given time for any given economic interaction, which can be different for different customers.[15] Supply and demand is also, simultaneously, managed intelligently by these platforms. It results from direct data-based deep knowledge about actors and activities on both the supply and demand sides, and not necessarily price-based information. Economic relationships are tending towards long-term »servicification«, as platforms tend towards subscription models.[16] It is such post-industrial and post-market nature of platforms that renders them so ungovernable for traditional regulatory mechanisms.

Global corporations had needed national governments to frame and enforce strong laws to enable IP-based value capture. In the digital arena, however, they rely on lawless extraction of data from everywhere, through sheer digital presence and power. They avoid legal discussions about data's economic value so as to keep attention away from this lawless activity[17]. What they use instead is what has been called ›code is law‹, and ›architecture is policy‹.[18] Code and architecture refer to the software that digital corporations employ over networks globally, e. g. cloud applications, that form the »body« of new digital economic and social systems. Technical controls through software are foolproof, and effective remotely. Corporations do not need much legal protection for valuable data they collect and hoard, because it operates mostly behind technical walls. Technology also provides all-round coercive power for enforcement. The owner of a physical mall, for instance, may require legal help to evict a recalcitrant shopkeeper, but a trader on an e-commerce platform can simply be ›deleted‹ by technical means – immediately, and without recourse.

The US is the main political backer of the hegemonic Silicon Valley model of digital economy, with its globally integrated, monopolistic digital corporations. The US government employs trade agreements and other means towards a single borderless global digital economy, with free data flows (and extraction) and scanty means for national regulation. It is based on private law arrangements anchored in the jurisdiction where digital corporations are headquartered, mostly the US.[19] The spectre of a single global US-controlled digital economic space has of late been altered by a no less distressing prospect of a bipolar digital world, with competing, and increasingly exclusive, digital value chains respectively centred in the US and China.[20] The digital rivalry between the two countries is extending beyond economic fields to all areas, including security and military, conjuring up parallels to the Cold War era.

Data and digital intelligence are at the fulcrum of control exercised by a few digital corporations over the global economy and society. Such control is applied remotely and monopolistically in a manner that *inter alia* leaves very little

10 https://www.theverge.com/2016/6/27/12048482/alphabet-sidewalk-labs-public-transport-columbus-ohio

11 https://www.technologyreview.com/s/614057/china-squirrel-has-started-a-grand-experiment-in-ai-education-it-could-reshape-how-the/

12 https://www.cbinsights.com/research/apple-healthcare-strategy-apps/

13 https://medium.com/sidewalk-talk/reimagining-cities-from-the-internet-up-5923d6be63ba

14 https://lawreview.law.ucdavis.edu/issues/51/1/symposium/51-1_Cohen.pdf

15 https://www.getelastic.com/dynamic-pricing-and-the-new-formula-for-profit

16 Not only is Netflix offering subscription-based cinema, physical services like Uber, and even consumption of physical goods, like with Amazon, are becoming subscription-based.

17 They do apply private law of contracts to their benefit wherever necessary.

18 https://www.harvardmagazine.com/2000/01/code-is-law-html and https://www.eff.org/fr/deeplinks/2010/03/video-eff-panel-architecture-policy

19 The US government's vision of ›commerce without borders‹ can be found in its policy document. Digital 2 Dozen, https://ustr.gov/sites/default/files/Digital-2-Dozen-Final.pdf

20 Kristalina Georgieva, Managing Director of the International Monetary Fund, spoke of a »digital Berlin Wall« that forces countries to choose between technology systems. https://www.imf.org/en/News/Articles/2019/10/03/sp100819-AMs2019-Curtain-Raiser

scope or power for bargaining by workers. The global and vertically integrated nature of these digital corporations allows them to assume roles that have traditionally been the preserve of the public sector. The following two sections explore these two issues.

3

DATA CONTROLS – AND HOW TO TAKE THEM BACK

Data gets created by the actions of ordinary people, consumers and small economic actors[21] that use digital platforms. This data is vacuumed up by digital corporations and converted into digital intelligence to organise, direct and control all other actors. Intelligence based dependence is naturally very strong. It is further locked in through vertically-integrated technical structures that are highly monopolistic. The result of all this are very lop-sided terms of engagement between digital corporations and all other economic actors. In such circumstances, what are the options for small economic actors, including workers, to improve their economic power, and thus their bargaining position?

Digital value chains begin with data originally provided by individuals and small economic actors. Such data is unilaterally appropriated by digital corporations, capturing the entire economic value of data and its intelligence derivatives. Its fairness can be questioned. Since the key data at the heart of digital power emanates from individuals and small actors, and is about them, can they claim collective rights and ownership[22] over the economic value of such data? Exploring political economy and legal frameworks in this direction provides the best structural way to decentralise digital power.

Individual data rights are relatively well-developed, especially in terms of protecting privacy. Personal data is considered to be an extension of »person-hood«. It defies reason why a similar conception is not extended to social or group data.[23] This is data that may not be personally identifiable, but refers to a clearly identifiable social or economic group of people. One example would be data about people from a minority religious community living in a particular neighbourhood. Or, to take an economic example, collective data on the commuters in a city. Employing the analogy of personal data, such group/community data should also be considered to be an extension of the relevant community's »community-hood«. Just like personal data in respect to an individual, such data is intrinsically – and often inalienably – associated with the particular group or community. It gives very significant power over the group/community, and can be used to specifically harm or benefit it. This provides the basis for asserting a group or community's primary control or ownership over its group or community data.

Beyond privacy rights, some work is also happening on an individual's economic rights to her/his data. Two approaches stand out in this regard. One is the right to data portability, whereby individuals can have their data retrieved and transferred to another service provider of their choice. This is an important right and should be ensured everywhere. However, in terms of its practical benefits, it perhaps merely makes companies somewhat cautious when it comes to very aggressive exploitation of data, especially if it is of a discoverable nature. It has not been effective in checking or decentralising the economic power of global digital corporations. A year after the enactment of the EU's General Data Protection Regulation, which contains such a provision, it is interesting to note that large global digital corporations have actually increased their share of the EU market.[24] Ordinary individuals cannot be expected to possess the skills required to manage their intricate data, especially as everything becomes data-based; their individual data-bargaining power is too little to matter much; and, in any case, individuals tend to focus on the immediate gratification that they get from digital services.

All these factors apply equally to the second approach – monetising an individual's data. Apart from having been found to be ineffective,[25] it can be positively dangerous, as individuals would formally transfer all or most of their data

21 Platform companies are unique in how they use data and digital intelligence to closely control, and thus exploit, all other actors in a value chain, whether these be small producers/manufacturers, traders, service providers or workers. In relation to the digital power of platform or digital companies, all these can be grouped together under the rubric of ›small economic actors‹ in any digital value chain. This term is employed often in the paper, since all of these actors are subject to data controls, and should enjoy some data rights because they are the major contributors of data that underlie the economic power of the digital corporations involved.

22 The term »ownership« most appropriately applies to physical goods that are exclusive in their use. Data can simultaneously be used by many actors, who could also have different kinds of right of use. It is therefore more apt to argue for ›primary economic rights to data‹ rather than its ownership. The term »ownership« is used here in a manner of speaking to refer to such primary economic rights.

23 Does this follows from the neoliberal dictum best expressed by Margaret Thatcher when she held that ›there is no such things as a society...‹?

24 https://www.fastcompany.com/90351655/gdpr-helps-google-and-facebook-grow-uk-market-share-in-2019

25 https://www.wired.com/story/i-sold-my-data-for-crypto/?verso=true

rights for a paltry sum. The economic value that would get expropriated from an individual (apart from other possible harms) is likely to be several times higher than the monetised value.

As the digital economy shifts from being primarily based on targeted-advertising - which foremost requires personal data – towards digital-intelligence-based management of economic activities across a sector, it is aggregated group data that becomes most important, even when it is personally anonymised. With the greatest value offered by data increasingly being relational with respect to other data, the marginal value of any one person's data contribution is very low – if it can be calculated in any meaningful way in the first place.

The proposition of ›data as labour‹ is similar to the above approaches in that it is individualistic, and also displays all the same shortcomings, apart from other conceptual defects. For one, data is quite unlike labour, which needs to be sourced anew for every instance of production. Data once contributed is useful forever.[26] Data therefore may have sharply declining returns for its contributors. A machine, once it learns from humans how to perform a task, does not have to be trained again to do the same task.[27] The »labour« of data contribution involved in such training therefore becomes worthless immediately, unless some kind of permanent rights to the value of data once contributed can be established. Individual rights of this kind are difficult to conceptualise and practise, since, as discussed earlier, data's value comes mostly from its aggregated forms. They are also very hard to bargain for and obtain individually.

For all these reasons, a collective approach is required to assert data-based economic rights. Such an approach is premised on a group/community's primary economic rights to the data that ›arises from it‹ (data source), and is ›about it‹ (data subject). Such data can be characterised as group or community data, and collective economic rights over it as group/community ownership of data.[28]

It is not possible to trace out in detail here the conceptual basis for collective ownership of community data.[29] Two main elements of this may briefly be touched upon. First is the analogy to natural resources which are supposed to be owned by the owner of the physical space or geography from whence such resources arise. The Nagoya Protocol to the Convention on Biological Diversity requires that the benefits of using genetic resources arising from a particular community be fairly and equitably shared with it.[30] In a similar manner, much of society's data can be considered to be a collective social resource owned by the social unit from whence it arises.

The second conceptual basis may be even more important. It involves the subject of data, or ›whom the data is about‹. Data's main value is in the intelligence that it provides about the data subject. We should in fact not just be speaking about companies having data on us, but their having intelligence on us.[31] This renders the socio-economic implications involved much clearer. The defining feature of a digital society and economy is that, for the first time, intelligence gets systematically disembodied from humans, or human organisations, into machines. Such intelligence is not just some kind of piecemeal knowledge about us, like that generated by a market survey or a loyalty program. It is highly granular and systemic, like a brain incessantly taking in bits of information and synthesising them into continuous new controls and actions. Digital intelligence is all-pervading, often exceeding what we know about ourselves, and is largely auto-executing.[32] Because the phenomenon is new and unique, we require *sui generis* ways to describe and deal with it. Such disembodied intelligence is perhaps the strongest possible power over its subject. It is an easily justifiable moral philosophical principle that the ›subject of intelligence‹ should be the primary owner of systemic intelligence about itself – individually and collectively as a group or community. This is the second basis of community ownership of data, being data and intelligence »about us« and providing immense power over us.

The term »ownership« in relation to data tends to run into some resistance in progressive circles because the last key political economy battle was (and still is being) fought over knowledge as an economic resource. The progressive take on this has been to minimise if not eliminate the notion of ownership of knowledge, promoting it as a common resource for all to benefit from and contribute to. So, why now propose legal ownership with regard to data? Would it not just enable big corporations to turn our data into their property, just like they have done with our knowledge?

It is important to understand the difference between knowledge – as the subject of intellectual property (IP) debates –

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26 Accenture calls artificial intelligence a capital-labour hybrid https://www.accenture.com/sk-en/insight-artificial-intelligence-future-growth

27 This has been referred to as ›industrialisation of learning‹. https://www.ictsd.org/sites/default/files/research/rta_exchange-the-digital-transformation-and-trade-ciuriak-and-ptashkina.pdf

28 The term »ownership« is employed to stress the economic aspect of data rights because most people today instinctively associate data rights only with privacy and security.

29 The conceptual basis of collective ownership of data is presented in this paper titled ›Data and digital intelligence commons‹, http://data-governance.org/report/data-and-data-intelligence-commons

30 https://www.cbd.int/abs/about/

31 This is how key digital business actors see the field. Upon being asked if digital innovation was still an open field, Dara Khosrowshahi, ex-CEO of Expedia and now of Uber, observed, ›… Googles and Facebooks of the world have so much more intelligence as to mass consumer behaviour that they probably have an unfair advantage …‹. https://www.nytimes.com/2017/10/18/technology/frightful-five-start-ups.html

32 For instance, algorithms of an e-commerce platform match goods to our perceived preferences, and even set the prices contextually. The full transaction can get completed automatically, without any human intervention.

and data as an economic resource. IP over knowledge is about claims to newly created ideas or other, more concrete, intellectual artefacts like works of art, designs, etc. However questionable the claim of their being new and private might be in any particular case, the premise is that there is a distinct creator of a particular piece knowledge who is preferentially entitled to some of its fruits. In the absence of legal checks, anyone can exploit such valuable knowledge the moment it gets known. Corporations, which usually internalise IP rights, have needed law to help gate-keep such knowledge and extract rents from it. Although perhaps unrecognisable in that form today, IP rights first came about in order to ensure wide sharing of new knowledge, even as creators were allowed some limited, time-barred entitlements. It was argued that in the absence of some such legally enforced rights, creators tend to hoard knowledge for exclusive use, which is detrimental to social well-being.

The current model of employing data as an economic resource is very different, as explained in the first section. Technical means of collecting and hoarding data are specifically designed for the purpose of its exclusive use, or within the framework of limited partnerships. There is no act of creation involved,[33] only of collection and curation by digital corporations. The latter are prone to argue that other parties are welcome to collect the same data and use it. The problem is, however, that these digital corporations often perform infrastructural functions in any sector, and are hence, to a considerable extent, natural monopolies.[34] It is generally not possible for an aspiring competitor to create a parallel infrastructure that will yield the data it needs. Even if it was possible to do so, combining the two datasets will provide a much greater value, and therefore exclusive control of key sectoral data still runs contrary to overall social welfare.[35]

Digital corporations do not require the law to help extract and protect data value; they employ a combination of monopolistic economic power and technical means. In time though, as default processes of data appropriation get adequately entrenched, they will no doubt seek legal recognition and formalisation of them. The only way to throw a wrench in their works is to wield the law to establish prior economic rights to data for individuals, groups/communities, and small economic actors that contribute the data and are data subjects. As discussed in the foregoing, latter's data rights over those of digital corporations also have sound logical basis.

A key question to explore is: In the face of rapidly consolidating dominant practices, how digital corporations can be made to openly share their data for maximal social gain, including more market competition? This is also required to generally decentralise digital economic power. What is being proposed here is a legal assertion of collective economic rights of original ›contributors of data‹ (data sources), and those ›whom the data is about‹ (data subjects). The aim is to ensure broad sharing of digital data, but with due individual and group/community protection.

Individualistic frameworks for economic rights to data are ineffectual because individuals have limited means to actually use the data meaningfully. And, the mostly monopolistic or duopolistic nature of any digital market constrains data portability, which in any case is made very difficult through various hidden costs. Groups and communities, on the other hand, can have enough collective leverage and options to meaningfully exercise their collective economic rights to data. They can run a digital business in a cooperative manner, as advocated by the platform cooperativism movement.[36] A city or provincial community can employ its collective rights over its commuting data to mandate that it be opened up to a competitive field of digital businesses, and/or allow solely local businesses to run ride-hailing platforms. Digital corporations can be subjected to licensing for using community data and thereby be closely regulated, like utilities. Digital and data value can be considerably internalised within the relevant community, ensuring that locally articulated public interest is upheld, including economic fairness and justice.

While mandating the sharing of community data held by a company, data collection can be incentivised, as and when specially required, by not interfering with a data collecting company's exclusive data use for certain purposes and for limited time periods. It is important to make it clear here that this is not meant to create new data rights for data collectors, which is not advisable. It will only be a default privilege allowed under community data licensing. Meanwhile, not all data will be covered under community ownership frameworks, and many kinds of data will continue to be considered private.

The EU has been exploring how to ensure data sharing among businesses, and access to privately held data for purposes of public interest.[37] It has also looked into issues of data ownership, especially between owners of Internet-of-Things devices and those who run data applications on them, proposing the concept of »data producers' rights«.[38] The German Social Democratic Party proposes a ›data for all‹ framework for data sharing.[39] But these approaches are still tentative, and the EU is yet reluctant to openly break with the default political economy of data

33 »Facts« cannot be protected under IP laws.

34 Many of these are erstwhile public-sector functions.

35 These could be augmenting datasets or complementing datasets, respectively providing economies of scale and scope.

36 https://wiki.p2pfoundation.net/Platform_Cooperativism

37 https://ec.europa.eu/digital-single-market/en/guidance-private-sector-data-sharing

38 https://ec.europa.eu/digital-single-market/en/news/communication-building-european-data-economy

39 Available in German only here: https://www.spd.de/aktuelles/daten-fuer-alle-gesetz/ A report of the German Ministry of Economic Affairs indicates a similar way of thinking: https://www.bmwi.de/Redaktion/DE/Downloads/Studien/modernisierung-der-missbrauchsaufsicht-fuer-marktmaechtige-unternehmen-zusammenfassung-englisch.pdf?__blob=publicationFile&v=3

that underlies the dominant Silicon Valley model. Since developing countries face the greatest geo-economic data-appropriation threat, they are willing to venture further, even with their limited capacities. (Incidentally, for similar reasons, developing countries have spearheaded the global struggle for access to knowledge, resisting aggressive intellectual property frameworks.) India has come up with a draft policy with community data provisions.[40] Rwanda has a data sovereignty policy, providing for national ownership of data.[41] South Africa, too, is exploring this area.

Questions have been raised in the EU about who has the rights to consumer data about products sold on the Amazon platform – the latter or the manufacturers and traders that put up the products on the platform.[42] Similar issues have been raised in India by restaurateurs about their products that are distributed by food-delivery platforms.[43] Not just geographical communities, but communities or groups of economic actors should also be eligible for collective ownership of data that they contribute. Uber's main asset is data, most of which comes from its drivers. Community or group data ownership can be invoked by Uber drivers in a city, for instance, to claim a collective stake in the vast data-based value of the Uber company. They can thereby possibly seek co-determination rights to the business in the form of adequate representation in the management.[44]

This logic can also be extended to workers formally employed with a company or an organisation. Unlike with Uber, the workplace and work-tools in this case are company-owned; whereby data arising from work, whether or not contributed or mediated by workers, will be claimed by the company to be legitimately its to own. Products of workers' labour are after all owned by the company, and workers just remunerated for their labour. For workers in existing work relationships, data contribution would be considered as a part of the overall work role and expectation, and subsumed in existing remuneration. This is especially so because digital data contribution in itself is often a passive activity. Data should be considered as a very special kind of value contribution, different from labour.

Data contribution consists of passing on intelligence that is about oneself, one's area of work, and one's skills, that is captured in and for machines. This has permanent, replicable value, unlike labour that has to be contributed anew for every instance of production and can therefore serve as a continuing source of remuneration. Intelligence created from workers' data can and will be used to control workers, and in time possibly to replace them. These, in fact, are the two biggest sources of value for a digital corporation. Much better control over all economic actors, including workers, in a sector helps organise them more efficiently, and thus more profitably (think Uber).[45] And then, whenever possible, totally replacing them with intelligent machines – trained by intelligence derived from replaced workers – can be even more profitable. Data that workers contribute therefore may retain a permanent relationship with them – whether in work or displacement. With data it cannot just be a matter of being paid one-time for contributing it.

Rather than being paid for it – which is in practice difficult to effectively realise, data (and thus intelligence) contributing workers should have a collective stake in the resulting intelligent products and services. At the very least, these products and services should not be able to be employed in ways that are harmful to the contributing workers' interests – like exercising inappropriate controls over them, or displacing them. Furthermore, the economic value from such intelligent products and services should be fairly distributed, with adequate provisions for the data contributing workers' share in it.

Labour theory of value – arguing that labour expended in making a product primarily constitutes its value – was applied in support of the rights of the working class in the Industrial Era. A corresponding ›data theory of value‹ for intelligent production – allocating primary value contribution to data sources and subjects – may be required in the digital age to protect and promote the rights of workers and the masses against owners of digital capital.[46] This is especially salient in the face of the threat of increasing displacement of labour by autonomous machines. Due to constraints of space, this subject is not explored in any more detail here.

Workers need to engage with other marginalised actors in a digital economy to first of all seek a general framework for group/community ownership of data. This then has to be nuanced to specific contexts, in the direction of a just and equitable digital economy. Public sector workers need to examine in a forward-looking manner the nature and role of data and digital intelligence in their work. They must assert their rights to the value of data and intelligence that they contribute. These rights can be employed to improve their bargaining power, and to enable participation in public sector management and decision-making.

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40 https://dipp.gov.in/sites/default/files/DraftNational_e-commerce_Policy_23February2019.pdf

41 http://statistics.gov.rw/file/5410/download?token=r0nXaTAv

42 https://www.nytimes.com/2019/07/17/technology/amazon-eu.html

43 https://www.cci.gov.in/sites/default/files/whats_newdocument/Market-study-on-e-Commerce-in-India.pdf

44 https://en.wikipedia.org/wiki/Codetermination_in_Germany

45 This is not to say that greater control, or power, over actors involved in an economic situation has no positive value at all for the society. Better organisation of economic activity is of course very important which involves some such power centres. The question is how justly or otherwise such control and power is exercised.

46 As mentioned earlier, owning digital intelligence is the primary means of owning digital capital.

4

DATA AS PUBLIC GOOD, AND THE PUBLIC SECTOR

Understanding the nature of the emerging digital economy and society, and recognising people's collective rights to their data, can help to determine how society's very important new data and digital intelligence based roles should be divided across public, community and private sectors. The objectives of high productivity as well as of fairness and justice need both be addressed in this regard.

The currently dominant models of digital technology, economy, and society were born and developed at a place and time of ascendant neoliberal ideology, namely in the US of the decades of 1990s and 2000s. These models are consequently almost entirely ruled by the private sector, with practically no role for the public sector. Given the need for rapid innovation and disruption at the early stages of digital technology application, private sector leadership may have had some justification. But with the digital society structures becoming entrenched now, and increasingly dominating all sectors, public sector's appropriate role in a digital society warrants assessment.

Key digital transportation data being largely in the hands of a few digital corporations, it was mentioned previously how some cities in the US have considered handing over practically the entire public transportation sector to private management. Massive AI-based private education projects may push into oblivion the school system as we know it, and along with it also the educational authorities. Corporations holding health data are set to reorganise the health sector supplanting the role of public health systems. Digital corporations are developing smart city projects in which their control over city data converts into *de facto* governance of the city.

Not just provision of services, the very acts of public policy-making and governance would soon be impossible without access to society's digital data. Most of such data currently remains a private resource of digital corporations. They may *pro bono* share some of their data for purposes of public interest, for example, Facebook's »Data for Good« and Uber's »Uber Movement« initiatives. But such sharing obviously happens on the whims and terms of these corporations, and follows their own interests. It can hardly serve as the basis for how public policy and governance are to be undertaken in the digital age.

Let us consider a city that is planning smart traffic management, which will require access to real-time commuting data that mostly is only available with Google. Would the city authorities have to beg Google for this data or, as the dominant data economy model becomes mainstream and »accepted«, have to buy it? Even more likely, they may have to let Google, or some such digital corporation, manage city traffic services. This will involve monopoly service fees and lock-ins. Leveraging their new position, as the corporation involved gathers ever more city data, it will use it to forever keep improving its services – and increasing the fees. Such a situation of irretrievable lock-in and ever-deepening dependence on a private provider for a public service may *prima facie* look entirely untenable, but that is where we seem to be imminently headed. This traffic management example can be extrapolated to every single area of public sector work, from city planning, community development and welfare services to utilities management, education, health, agriculture support, and more.

A central role of community data for a whole range of services that have traditionally been provided by the public sector points to the immense, and indispensable, public value of such data.[47] It makes a compelling case for community ownership of this data. Such ownership can enable free access to community data held by private companies whenever needed for purposes of public interest.[48] This arrangement in fact appears absolutely necessary, unless the public sector is soon to – more or less – collapse completely. While data required for directly providing public services can be called as a core public interest need, other kinds of public interests are also relevant. Two such further purposes of public interest that require mandated sharing of data are (1) to ensure an open and competitive market for digitally intelligent products and services, and (2) to support domestic digital industrialisation.[49]

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47 Public value refers to the value created by government through services, laws, regulation and other actions. https://www.themandarin.com.au/104843-measuring-public-value/

48 India's AI strategy refers to mandatory data sharing for purposes of public interest, and some EU policy documents are also beginning to veer towards this view.

49 India's earlier referred draft e-commerce policy proposes such data sharing with small enterprises.

Is the public sector ready for new data-based roles? An appropriate theory about such roles for the public sector, and the enabling policies and laws – like on community data ownership, are certainly needed first. But equally important are the practical details.

Much of the change and restructuring will take place within existing public sector bodies and institutions, like those providing services of transportation, health, education, welfare, etc. These bodies will have to become adept at collecting and curating the required data from their existing activities, as well as privately held data that they will get access to under community data ownership rules. Competencies will have to be developed to convert data into necessary digital intelligence, and use it to provide intelligent public services (of course with the help of data scientists). Considerable skill development and upgrading may be required for public sector workers, including bringing in new technical skills. But, at its core, digitalisation and datafication of the public sector is not so much of a technical challenge – as often feared – as it is of strategic visioning and able management. Public sector workers should be able to adapt to new data-intensive work processes as successfully they did to computerisation in the public sector many years ago.

Some of the required public sector restructuring may be relatively intensive, even if undertaken gradually to accommodate human and other kinds of costs. Some public-sector roles may indeed become less important in the digital society, but many entirely new ones will emerge.

With industrialisation, the public sector acquired the important role of providing key industrial infrastructure. It should be taking up a similar role with regard to digital infrastructure. If any such new role for the public sector is hardly ever discussed it owes largely to the digital society's birth and upbringing in a neoliberal environment. Global, vertically integrated digital corporations, spanning several sectors of the economy, internalise what are appropriately infrastructural and public-sector roles. Not only are the new digital infrastructure roles private right from birth – a creeping acquisition of existing public infrastructure roles is also taking place. An illustration of this is private digital currency initiatives like Facebook's Libra seeking to take over the government role of managing currency as the token of value in economic exchanges.[50]

New digital infrastructure areas range from digital connectivity and basic computing facilities to cloud computing and data provisioning.[51] This paper focuses on data and digital intelligence infrastructures.

As the very basis for intelligent production – of intelligent products and services – data is required for all important digital economy activities. Being in the nature of information, data is *prima facie* a non-rival good. Also, as data is combined with other data its value increases dramatically. This makes a case for provision of important data as a common infrastructure to all digital economy actors in any sector. The current digital economy model, however, is based on exclusive appropriation of society's data by a few monopolistic digital corporations. They thus increasingly control the value chains in all sectors. Such exclusive use of the common resource of society's data is the main reason for increasing concentration of digital power, and to a good extent also of increasing economic and social inequalities. Data sharing, or providing data as a common infrastructure, maximises the benefits that a society can derive from data. Sufficient open availability of key data is also the *sine qua non* for a competitive digital economy, and for reversing the damage being caused by concentration of digital power in a few hands.

The concept of data infrastructure is drawing increasing attention.[52] This differs from the earlier open data movement, which consisted mostly of putting public data out in the open for anyone to use. Key data in different sectors mostly used to be with the public authorities; but today private digital platforms are the biggest holders of such data. Furthermore, digital society's granular and intrusive digital data is of a nature that requires considerable protection against misuse. Such data has to be shared in a regulated and managed manner.[53] Data infrastructures are designed for safe sharing of sector-wide data taken from different sources.

Command over AI is the new basis of economic power.[54] Various national AI strategies rightly focus on data availability, which requires data sharing.[55] They promote institutions like data infrastructures, data trusts, data exchanges and data markets, in order to ensure increased access to data for digital economy actors. Although mandated data sharing does get mentioned in some places, these national strategies mostly discuss voluntary data sharing. It is not explained, however, why the biggest collectors of data – digital platform companies – will on their own share or even sell their data when they consider maintaining exclusive access to data to be their main business advantage. In pussy-footing the obvious need for mandated data sharing, the framers of these national AI strategies seem to be

50 https://www.cnet.com/news/facebooks-libra-cryptocurrency-could-be-banned-in-india/

51 The EU has infrastructural projects in areas of high-performance computing and low-power micro-processors required for large data and AI applications. https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=56018

52 https://www.stateofopendata.od4d.net/chapters/issues/data-infrastructure.html

53 »Open data« is in general useful, with little potential for harm. Digital economy data provides granular intelligence on specific individuals and groups and may carry great potential for harm. It therefore cannot just be made open to anyone and everyone without protections.

54 Russian President Vladimir Putin has observed that whoever takes the lead in AI will become the ruler of the world. This corresponds to leadership in industrialisation in an earlier era. https://www.theverge.com/2017/9/4/16251226/russia-ai-putin-rule-the-world

55 UK's AI strategy at https://www.gov.uk/government/publications/artificial-intelligence-sector-deal/ai-sector-deal; India's at https://www.niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf?utm_source=hrintelligencer; and France's at https://www.aiforhumanity.fr/pdfs/MissionVillani_Report_ENG-VF.pdf

tactically avoiding too direct a confrontation with the dominant political economy of the digital society, backed as it is by the most powerful global economic and political interests. But since effective data access and data sharing lie at the heart of any possibilities for AI and digital industrialisation, this weakness ensures that these AI strategies are doomed to failure in their current forms.[56]

Data infrastructures are not ordinary optional projects that can provide certain benefits; they constitute the very foundation of a strong domestic digital and AI industry, and ensure its openness and fairness. Data's privatisation and monopolistic appropriation, on the other hand, is at the core of the dominant digital economy model. There is no escaping this paradox; it needs to be squarely addressed and urgently resolved.

Public data infrastructures have to be a key part of the new digital institutional ecologies. Most of them will be directly run by the public sector as a part of existing public departments or agencies in different areas, or will be operated by setting up new cross-sectoral agencies. Some data infrastructures could be managed in partnerships with non-profits or businesses, and others run privately as regulated utilities. Effective regulation for data markets is also required. Public sector capacities need to evolve for all these roles.

Public data infrastructures in different sectors – commerce, transportation, finance, tourism, agriculture, health, education, the labour market, and so on, are necessary to (1) deliver respective intelligent public services, and (2) robust private sector development, supporting a host of competitive digital businesses in each area.[57] Data infrastructures play a central role in digital industrialisation, especially by nurturing domestic businesses.[58] When intelligent products and services are competitively available, and lock-ins made difficult with effective data-portability laws, it enables better distribution of digital power across an economy and society, as well as globally. This can ensure the best value for consumers, and greater bargaining power for workers and other small actors in digital supply chains.

India is developing public data infrastructures in many sectors, ranging from commerce and finance to health, education and agriculture.[59] The EU is creating data exchanges in the areas of transport,[60] logistics,[61] and health,[62] and a common database of health images to support AI applications in healthcare.[63] Similar initiatives are cropping up all over the world. Public data infrastructures will in time further specialise and evolve to provide not just raw or semi-structured data, but also its higher derivative forms. These could range from structured data and trained AI models to actual AI as a (public) service.[64]

Much discussion gets devoted nowadays to speculation over ›AI versus humans‹. But the most important political and economic question currently is: Who owns and controls society's AI systems, or ›systemic intelligence about us‹? This is granular, real-time intelligence about – and thus nearly absolute power over – every niche and element of our socio-economic organisation. Is it with a handful of actors? Should we all not own it collectively? (Although uses of such digital intelligence, in many acceptable areas, will certainly need to be licensed under regulated conditions to private businesses for greatest productivity.) Our collective ownership over systemic digital intelligence about ourselves, as well as over the data from which it is derived, implies that a society's data and digital intelligence are to be public goods.

Striking at the heart of the default dominant model, such a public goods perspective provides us with a new point of departure towards a digital economy and society that is just, fair and equitable. It will take forward the mixed economy and welfare state models that characterised the dominant post-war consensus,[65] but have been upstaged by the neoliberal assault.[66] The latter has employed the cover of rapid digital flux to gain much new territory with respect to society's systems and institutions. If properly conceptualised, strategised and politicised, the same digital shift can in fact be leveraged to rehabilitate the pre-neoliberal consensus. This is because, as presented in this paper, the key resources of the digital economy – data and digital intelligence – have some inherent features of a »social commons«.[67]

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56 The paths adopted by the US, as the first starter, and China, which thoroughly fire-walled its nascent digital economy, are generally not available at this stage to other countries for digital industrialisation.

57 See the chapter on ›Public data infrastructures‹ in the paper ›Digital industrialisation in developing countries‹ https://itforchange.net/sites/default/files/1468/digital_industrialisation_in_developing_countries.pdf

58 Ibid.

59 Ibid.

60 https://ec.europa.eu/transport/sites/transport/files/themes/its/doc/c-its-platform-final-report-january-2016.pdf

61 https://www.iru.org/resources/newsroom/eu-digital-logistics-platform-puts-e-cmr-test

62 https://ec.europa.eu/digital-single-market/en/exchange-electronic-health-records-across-eu

63 https://ec.europa.eu/commission/presscorner/detail/fi/memo_18_6690

64 ›AI as a service‹ is an emerging business model. The public sector will need to move away from just using AI applications – which compromises its hold over the value of very important data that passes through its hands – and also specialise in providing some public-infrastructural AI services.

65 Somewhat arbitrarily, treating communism here as an exception.

66 Caught on the wrong foot by a bipolar digital world dominated by the US and China, EU leaders are beginning to think aloud in favour of such a »middle path« political economy for the digital society. https://www.politico.eu/article/germany-falling-behind-china-on-tech-innovation-artificial-intelligence-angela-merkel-knows-it/

67 http://datagovernance.org/report/data-and-data-intelligence-commons

5

WHAT PUBLIC SECTOR WORKERS CAN DO

Most progressive engagement regarding public sector workers in the digital society focus on retrenchment due to automation and informalisation of work through digital platforms. Some attention is also being devoted to data-based surveillance and control over workers. Such a reactive stance to society's digitalisation will need to persist, addressing the ›here and now‹ of its negative impacts. However, in mid- to long-term strategy, it has to be coupled with a pro-active approach of positively engaging with digital changes. Considerable digital change need to be seen as being largely inevitable, and potentially useful to the extent that it can enhance productivity and general social welfare, like the Industrial Revolution did in an earlier era. But there is no single necessary design or pathway when it comes to digitisation of our societies, even though the Silicon Valley model tries to pose as such.

At the highest level, public sector workers will need to work with progressive forces worldwide to shape an alternative model of digital society and digital economy. Such a model will have an appropriate distribution of roles between the public and private sectors, and include effective national digital regulation. It should be fair to small economic actors, including workers, and lead to a just and equitable society. Such an alternative model is entirely possible, especially in this formative period of a new socio-economic paradigm, as the various tensions and developments discussed in this paper indicate.

At the next level, public sector workers need to engage with not only the general workers' movement but all »small actors« in the digital economy – like small enterprises, traders and farmers, who are being squeezed by digital corporations through unilateral appropriation of their data. Collective or community rights of data contributors will be the appropriate strategy to pursue by all these groups, who should apply their combined political weight to this end.

And, lastly, closer to home, public sector workers can help develop a new vision and role for the public sector in a digital society, especially in terms of data and digital intelligence as public goods. This will help strengthen public services in every area as they are digitally transformed, instead of weakening them as is currently the case. Some important new public sector roles, like managing data infrastructures, are also coming about. Shaping a strong new public sector for the digital society requires much more a change in mindset, and ideology, than it does technical expertise and upskilling. The latter are quite manageable if planned well.

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ECONOMIC RIGHTS IN A DATA-BASED SOCIETY

Collective Data Ownership, Workers' Rights, and the Role of the Public Sector

Our economy and society is increasingly controlled and reorganized by economic actors who are able to extract, own data and convert data into digital intelligence. Currently, these are US- and China-based digital corporations who – mostly via digital platforms – appropriate and dispose of the most important economic and social power resource of our time – aggregated group data.

Our collective future depends on whether we can ensure broad sharing of digital data with due individual and group protection. For the latter, we need to establish collective primary economic rights to data. Access to community data currently held by private actors is the fundamental pre-requisite for the very act of public policy-making and ensuring a fair economy.

For the public sector, this entails an imperative to change: it must henceforth be able to collect and curate data, convert it into digital intelligence and provide intelligent public services. While skills development and upgrading are needed, the more decisive challenge is one of visioning, exercising political will and managing a transition to use data for the common good.

Further information on the topic can be found here:
www.fes.de/gewerkschaften

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