



Data
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Data and Digital Intelligence Commons (Making a Case for their Community Ownership)

Parminder Jeet Singh



Data Governance Network

The Data Governance Network is developing a multi-disciplinary community of researchers tackling India's next policy frontiers: data-enabled policymaking and the digital economy. At DGN, we work to cultivate and communicate research stemming from diverse viewpoints on market regulation, information privacy and digital rights. Our hope is to generate balanced and networked perspectives on data governance — thereby helping governments make smart policy choices which advance the empowerment and protection of individuals in today's data-rich environment.

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IT for Change aims for a society in which digital technologies contribute to human rights, social justice and equity. Our work in the areas of education, gender, governance, community informatics and internet/digital policies push the boundaries of existing vocabulary and practice, exploring new development and social change frameworks.



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Abstract

Digital technologies once held the promise to be a great equaliser. As a digital economy takes shape, global inequalities however are rising sharply. Vertically integrated global digital corporations are set to rule every sector of the economy based on their exclusive control over its data, further concentrating economic power. There exists a political paralysis over regulation of such digital corporations. Any shift in the dominant digital model and practices towards greater fairness and sustainability requires first of all an examination of the political economy of data, and the digital intelligence that it contributes. Policy makers around the world are evidently becoming eager to explore ways for wide data sharing, with a view to its easy availability for domestic businesses. But there is a dearth of understanding and political will at the highest levels to develop the required new policies and laws for this purpose, as well as of viable practical models for data sharing. Very little theoretical work explores alternative models for economic governance of data. This paper attempts some new directions in this regard.

The digital economy can be understood as comprising intelligent systems running whole sectors, employing data based digital intelligence to re-organise and coordinate them. Within such a macro understanding, it is possible to apply the framework of Institutional Analysis and Development (IAD) developed by Elinor Ostrom to examine the management of data and digital intelligence resources at the community level in a given sector, like transport, under the dominant model. Such an analysis reveals very suboptimal results on almost all the key IAD evaluation parameters; from efficiency and equity to accountability and sustainability. The paper then proposes treating data and digital intelligence as common pool resources, under common property regimes. It briefly considers the kind of data governance arrangements that may be possible and necessary for a robust and fair digital economy. The discussion also subsumes key contemporary data related issues like the contestations around free global flows of data and the data rights of platform dependent actors, like taxi drivers and traders.

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Part 1 – The data problem

An unequal digital world

The Economist called data the new oil, and the Financial Times called it a new factor of production.¹ Terms like data economy and data society testify to the centrality of data in our social and economic systems. Data is the key resource feeding intelligent systems that are revolutionising productivity and transforming our economic and social relationships. Being such a central resource of our contemporary and future societies, the political economy of data remains strangely under-explored. Who has rights to data or owns it, who captures its value and how, and how are its benefits socially distributed? These are not questions of passing academic interest; their resolution will determine the very nature of our emerging digital economy and society. Economic governance of data constitutes one of the most important and urgent policy challenges today.

Early times of powerful technologies often induce windfall gains in productivity, and general social and economic welfare. With everyone gaining something new and useful, it is understandable that issues of distributional fairness get pushed back. But as the flux settles down, and paradigmatic technology shifts readjust social and economic structures, questions of how social, economic and political power is getting redistributed starts to come to the fore. We are currently at the beginning of such a phase.

Concentration of power with big tech corporations is a common refrain nowadays in the popular press and with politicians, especially in the developed world.² Its concrete social expressions are still less clear and not much discussed. Geo-economic power redistribution is an early concern being felt and articulated by those like the

1 The Economist. (2017). The world's most valuable resource is no longer oil, but data. *The Economist: New York, NY, USA*. Retrieved from <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data> and Jones, S. (2012). Why 'Big Data' is the fourth factor of production. *Financial Times*, 27. Retrieved from <https://www.ft.com/content/5086d700-504a-11e2-9b66-00144feab49a>

2 This is a big issue in Democratic Party campaign for the President election in the US. See, for instance, <https://medium.com/@teamwarren/heres-how-we-can-break-up-big-tech-9ad9e0da324c>

EU, Russia and India who fear relegation to the sidelines in the digital race led by the US and China. As for impacts inside national economies, issues like traders, cab-drivers and workers getting squeezed and displaced by digital platform companies, are beginning to show up. These are but the first faint sightings of what are going to be whole new economic and social structures of a digital society.

All current evidence – from what is becoming empirically visible, as well as the emerging theoretical understandings of the directions (Guellec, D., & Paunov, C., 2017) – is that these new social structures will be hugely unequal. A significant reason for this is that the dominant political view till now has been to avoid ‘disturbing’ the march of wonderful digital technologies, lest their development is weakened. Such a view has been very much helped by the congenitally global nature of the digital paradigm, which renders its national regulation *prima facie* difficult in any case. The centre of this paradigm is in the US; the digital economy contributes enormous wealth inflows to the US from across the world.³ The US’s extra-ordinary global power, not just economic and political but also discursive, has further buttressed the political and regulatory neglect with regard to the digital.

That the last two decades of adoption of digital technologies are also the ones of perhaps the fastest ever growth in inequality in the world might not just be a coincidence (Guellec, D., & Paunov, C., 2017). Even global business leaders are raising alarm that this kind of inequality is not sustainable, calling for redistributive measures (Rooney, K., 2019).⁴ Ever greater digitalisation of the society is likely to further aggravate inequality. Addressing digital society’s iniquitous tendencies requires first of all to understand its political economy. This, in our view, should begin with exploring the nature and political economy of the central resources of the digital society – data, and the intelligence derived from data.

³ Flow of data now contributes more to world GDP than flow of goods. See Tarnoff, B. (2018). Data is the new lifeblood of capitalism—don’t hand corporate America control. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2018/jan/31/data-laws-corporate-america-capitalism>

⁴ American billionaires call for upgrades to capitalism, starting with higher taxes on themselves. *CNBC*. Retrieved from <https://www.cnbc.com/2019/04/08/american-billionaires-call-for-upgrades-to-capitalism-starting-with-higher-taxes-on-themselves.html>

The myth of free flow of data

A resource is either owned, as in someone having private rights over it, or it is a freely accessible commons, like fresh air or the public street. Is data today a freely accessible commons? It is so only *vis a vis* whose data may be taken and appropriated. Global digital corporations incessantly vacuum up data about people's day to day activities as these increasingly involve digital platforms or applications. Some privacy protections may apply at some places, but corporations keep working their way around them.⁵ Apart from the highly contested device of consent, anonymisation is another ruse that is employed. Much of anonymisation is reversible (Lomas, N., 2019).⁶ Further, as explained later, aggregate non-personal data is increasingly almost as important for digital economy corporations as is personal data. These corporations also freely collect data from public places, like roads and other infrastructure – for instance, autonomous cars pilot programs gathering 360 degree visual and auditory data on public roads. Data may be freely collected even from private places, like drones filming farms across whole villages and districts. Data indeed appears to be a freely accessible commons in relation to whose data may be taken – without permission, much less remuneration. It is in this sense that the US and its allies have been demanding free global flows of data, without any national restrictions.

But what about the data once collected and with the digital corporations? Do others have the right to access and use it? Data being facts, it cannot generally be exclusively owned. Attempts have been made to obtain special rights to collected data, like the EU's *sui generis* data-base rights. The latter were disallowed by EU courts for passively collected data using digital applications and platforms.⁷ Other legal protections like trade secrets and contractual provisions are being employed for data exclusivity and control. The real operating control, however, is technical

5 A study indicates that Google has actually benefited from EU's General Data Protection Regulation, see <https://cliqz.com/en/magazine/study-google-is-the-biggest-beneficiary-of-the-gdpr>

6 Researchers spotlight the myth of 'anonymous' data. TechCrunch. Retrieved from <https://techcrunch.com/2019/07/24/researchers-spotlight-the-lie-of-anonymous-data/>

7 *Fixtures Marketing Ltd v. Oy Veikkaus Ab* (C-46/02, 9/11/2004), *Fixtures Marketing Ltd v. Svenska Spel Ab* (C-338/02, 9/11/2004) *British Horseracing Board Ltd v. William Hill* (C-203/02, 9/11/2004) *Fixtures Marketing Ltd v. OPAP* (C-444/02, 9/11/2004), referenced here: <https://ec.europa.eu/digital-single-market/en/news/staff-working-document-and-executive-summary-evaluation-directive-969ec-legal-protection>

protections. This is possible because digital economy interactions operate not so much in public spaces – an issue critically examined a little later, but largely within privately developed and managed techno-structures (Gurumurthy, A., Bharthur, D., and Chami, N., 2019). Stringent legal means to support Technology Protection Measures, against technical break-ins, even into self-owned technical artefacts, have been sought and mostly obtained successfully.⁸

Digital corporations are well-advanced in developing and entrenching their version of data frameworks and practices. So clear are they about data being the most valuable element that they open source or provide for free data software and applications, including the highest end AI software and applications. Microsoft became the most valued company at the turn of the century by selling monopolistic proprietary software. Google and Facebook followed it on the most valuable companies chart by offering free information and social media applications and monetising the enormous attention thus garnered through the network effect, dominating the advertisement market. With the advent of data economy, neither selling software nor advertisements is the main business model; it is to collect data and convert it into digital intelligence. How value is then captured from digital intelligence is what is behind the very definition of digital and data economy, as discussed in a subsequent section.

Google, Amazon, Baidu, Alibaba, Microsoft and Facebook, all have open sourced their AI engines. AI software and models are very expensive to develop, requiring scarce data skills, and very high computing power. But these digital corporations are not interested in directly monetising their AI models. What they want is for all actors to bring their data to these corporations' AI platforms, freely extract insights and employ them to improve their respective business or other activities. Much of this data, certainly the anonymised part, and insights from data, of course get vacuumed up by the host AI application or platform. The concerned corporation running the AI engine thereby keeps getting ever more 'data intelligent'.

⁸ Australian Law Reform Commission (2013). Technology Protection Measures. Retrieved from <https://www.alrc.gov.au/publication/copyright-and-the-digital-economy-alrc-report-122/20-contracting-out/technological-protection-measures/>. See also recent adverse developments related to cars and farm equipment.

What these corporations are developing are ‘data enclosures,’ where people and businesses can undertake their data related activities for free, leaving extremely valuable traces behind. These corporations till now only had access to such data that got exposed by individuals and organisations in using regular digital applications or platforms. But in using AI platforms, individuals and organisations will be digging up and presenting all their own data – and nearby ones – of the deepest and otherwise difficult to acquire kind, in order to extract AI insights from it to improve their own activities. The access of digital corporations to people’s, organisational and general social and economic data would thereby be near complete.

The business model here is relatively clear, although perhaps mind-numbing in its almost totalitarian social expanse and intrusiveness. It is to be the centres of disembodied intelligence of the world, sector-wise – or to be their ‘brains’ (Batra, G., Queirolo, A., & Santhanam, N., 2018)⁹; but also cross-sectorally, since intelligence is mostly cross-cutting. In a matured digital economy, access to such intelligence will be required for undertaking nearly every social and business activity of consequence. Each element of such intelligence-absorbing activities, in turn, provides further data to increase the intelligence of the sectoral ‘intelligence corporation.’

Instead of data corporations one should, in fact, be calling them ‘intelligence corporations.’ Data is just the raw material, the main valuable resource here is ‘intelligence.’ Digital corporations are centred on intelligence; whether that needed for car automation and running transportation networks, or for autonomously managing the entire supply and delivery chain of consumer goods. The centrality of the intelligence factor is also evident in the current hype around artificial intelligence or AI. AI technologies mostly are data technologies. Accenture considers AI as the new factor of production, instead of data, and perhaps rightly so (Purdy, M. and Daugherty, P., 2016).¹⁰ The socio-economic element in AI may more appropriately be called data intelligence or digital intelligence.¹¹

9 Artificial intelligence: The time to act is now. *McKinsey*, January. Retrieved from <https://www.mckinsey.com/industries/advanced-electronics/our-insights/artificial-intelligence-the-time-to-act-is-now>

10 Why Artificial Intelligence is the Future of Growth. *Accenture*. Retrieved from https://www.accenture.com/t20170524t055435__w_/ca-en/_acnmedia/pdf-52/accenture-why-ai-is-the-future-of-growth.pdf

11 UNCTAD (2019), *ibid*.

Coming back to where the data or intelligence value chain begins – corporations collecting outside data, it is evident that data is zealously hoarded for exclusive use and its value is appropriated unilaterally. There really are no free flows of data or ‘data commons’. Or, more precisely, it is a peculiarly one sided ‘data commons’; free for data corporations to take from but no obligation to contribute back. Such dominant data practices are socially unsustainable in the long run, as discussed later in this paper.

The defence of data hoarding

Data corporations, and other supporters of the default data frameworks, advance four main arguments in defence of the data *status quo*. First, that they make great effort to collect the data and it therefore does not come for free. Next, data is anyway collected within privately owned spaces – the platforms, involving private individual interactions. It is therefore theirs to use to their best benefit. Third, that they do not coerce anyone to part with their data; people and other actors wilfully give away their data in exchange for services that they find useful. If needed, and as privacy laws keep pushing for, they can make data contribution even more transparent. This apparently though does not seem to change much in terms of the extraordinary data power of these corporations. The fourth argument is that since the sources of data are out there, others can as well collect it and use it. The corporations claim no exclusive rights to collecting the data.

A fifth, consequentialist point is made that the default digital economy model is largely delivering. Any basic disturbance to it, like affecting the ease of collection of data and/or its exclusive appropriation by digital corporations, can lead to harmful consequences for everyone. In any case, it is claimed that a wait and watch strategy is best in these early times.

Let us examine the arguments provided above in order:

Firstly, the effort taken for data collection is contestable. Digital data collection is mostly passive, arising as a by-product of people conducting various social and economic

interactions over platforms run by these companies.¹² In any case, if required, it is possible to compensate the companies for the little effort that they might have put into data collection; for instance, they can be mandated to share the data with others on fair, reasonable and non-discriminatory (FRAND) terms.¹³

Next, regarding the claim about private ownership of the spaces of data collection – the platforms, and therefore of the collected data, it may be argued that platforms are public or quasi-public spaces, on the analogy of the legal nature of corresponding offline spaces involving publicly accessed important services. This is especially so when many of these platform services are of a necessary infrastructural nature. The interactions over such platforms therefore should also be considered public or quasi-public. Many authors (Constantinides, P., Henfridsson, O., & Parker, G. G. 2018), and politicians (Warren, E., 2019),¹⁴ have called for platforms to be considered utilities, in a similar quasi-public spirit. The data collected over platforms will thereby be deemed as data collected in public or commons spaces and interactions, and not private ones.

Thirdly, it is difficult to consider much data collection as not coercive when, for instance, waiting on the roadside for a ride, one is suddenly asked to provide consent to a data practice or else to forgo the service. Most digital services are similarly monopolistic, infrastructural, and solidly locked-in. Separately and independently articulated, immediate cost-benefit calculations of individuals on the threshold of availing a digital service, in any case, may not add up to the best long term common/public interest with regard to given data practises of digital corporations. Regular reports of intrusive data practices of corporations generally cause temporary disbelief and shock – and only for a very few activist-minded persons perhaps some real change in behaviour. But most people generally soon settle back into the comfort of beneficial, even addictive, digital services.

12 EU court in striking down sui generic database rights coverage of digital platform data. *Fixtures Marketing Ltd v. Oy Veikkaus Ab*, *ibid*.

13 European Commission. Building a European Data Economy. (n 4) 13. *European Commission*, FinTech Action plan (n 20) 7. Referenced here, pp. 37: https://www-cdn.law.stanford.edu/wp-content/uploads/2018/11/borgogno_colangelo_eulawwp38.pdf

14 Here's How We Can Break up Big Tech. *Medium*. *Medium*, March, 8. Retrieved from <https://medium.com/@teamwarren/heres-how-we-can-break-up-big-tech-9ad9e0da324c>

Further, as for the proposition that others are welcome to collect the same data and use it; key digital services are no longer just useful add-ons to our lives, as they first get perceived, but increasingly the essential infrastructures of a digital society. Like many infrastructures, they often are a natural monopoly, or nearly so, in their respective area of operation. This is due to both network effects and data effects (Constantinides, P., Henfridsson, O., & Parker, G. G. 2018)¹⁵. It is generally not possible, certainly not easy, for another business to set up a parallel infrastructure to collect the needed data. Without access to such infrastructural data, a new business cannot compete with the incumbent, and without successfully competing with it the start-up cannot produce the needed data. This chicken and egg problem causes a policy dilemma and confusion, discussed in the next section. Regulators have been unable to break this vicious circle running across data-exclusivity and monopoly digital structures. The essential facilities doctrine of competition law may be relevant here as a basis for mandating data sharing (Lehtioksa, J., 2018).¹⁶

And finally, the mentioned consequentialist argument, which is whether or not the current data paradigm is delivering, and would keep delivering in the future as we fully become a digital society. This may as much concern entrenched political ideological differences as legitimate dissonance in understanding and perceptions. The first section noted how digital society's growth has accompanied deepening inequalities. Most countries also fear being left out from, what is becoming, a two-horse AI race. In spite of these concerns, some commentators may retain a preference for global corporations to ideally be the main engines of social organisation and ordering – as a few digital corporations, owning and running the central 'data based intelligence' or the 'brain' of every sector, are headed towards. For others, the dire situation bespeaks an urgent need to reclaim political-democratic and commons institutions as the fulcrum of these fundamental, infrastructural, social functions. This difference of course relates to a larger battle of ideas being waged globally.

¹⁵ *ibid.*

¹⁶ Big Data as an Essential Facility: the Possible Implications for Data Privacy. Retrieved from https://www.paulo.fi/sites/default/files/inline-files/Lehtioksa%20Jere_pro%20gradu.pdf

This paper is motivated by the equity and democratic-commons standpoint. In addition to the logical ones, it thereby also advances a utilitarian and moral basis for moving towards distributed ownership and collective rights based formulations for the digital society's basic resources. The aim is to ensure that digital society's key resources, data and digital intelligence, are actually widely available for shared use, and not just hoped to be so. Data is the most valuable digital economy resource. Maintaining exclusive access to it by digital corporations is currently key to the dominant digital economy model. In such a background, ensuring effective data sharing will require fundamental policy and legal shifts. These will have to squarely address the question of primary rights over the economic value of data, which can loosely be called as ownership of data.

Ineffective data sharing policies

Most policy actors have begun to realise that the extraordinary power of digital corporations may need to be tamed. Many of them also clearly see sharing of, and access to, data as key to this end. This section discusses the emerging disquiet in policy circles across the world in this regard, and some attempts to do something about it. The discussion makes it evident that neither the current somewhat superficial understanding of the issue nor the piecemeal attempts to deal with it measure up to the society-wide problem of how monopoly digital power operates through exclusive controls over society's data. Frequent political statements from different quarters do express the need for some drastic changes. But the required political will to formulate systemic responses is yet to precipitate. The many signs of disquiet, even desperation, however, give some hope that this may happen sooner than later. They also provide pointers to what such a systemic response may look like.

One attempt to confront tech and platform power seeks separating platform as a marketplace from the business activities over it. India disallows foreign investment based platforms, like Amazon, from holding and selling their own inventory.¹⁷ A recent

¹⁷ Ministry of Commerce and Industry, Government of India. (2018). Press Note 2 (2018 series). Retrieved from https://dipp.gov.in/sites/default/files/pn2_2018.pdf

paper from the US argues persuasively for similar measures citing historical anti-trust approaches (Khan, L. M., 2019). Even though useful, such efforts do not hit Amazon's real monopolistic power of data and digital intelligence which it will still be able to employ for exploiting traders and manufacturers. The reason Amazon ventures into trading and manufacturing is to disrupt these links of the value chain, and demonstrate alternative ways to undertake these activities much more efficiently by integrating them into its digital intelligence systems. Having demonstrated such new methods, it could in any case, in time, have outsourced these activities (back), to actors now much more dependent on, and locked into, Amazon's digital intelligence (similar to how intellectual property holding companies employ outsourcing). Disallowing Amazon to undertake its own trading and manufacturing will slow down but not eliminate its planned digital disruption in trading and manufacturing layers, and Amazon's eventual close digital intelligence based control over them.

Our preliminary suggestion is that instead of just structural separation of the physical links of the value chain, as proposed above, regulators should also look at separating key monopoly-promoting links of the data value chain, because it is in the data layer where the real value resides. It can perhaps be mandated that consumer-facing data collecting businesses cannot also undertake the core business of processing data into general sectoral AI services and *vice versa*. The space and relationship between the two kinds of businesses will be mediated by data infrastructures and/or well-regulated data markets (Singh, P. J. 2019).

One problem about appropriately addressing the highly novel and unique issues around data and AI, and their systemic role in the digital economy, is of different policy actors approaching it from very different vantages and understanding. However, even if the right understanding existed, there are genuine problems about policy silos that inhibit working across them, as is needed in this case.

Competition authorities in the EU are becoming aware of the important role of data in creating and sustaining problematic levels of market power of digital companies.

A report for European Commission's competition authorities observes (Crémer, J., de Montjoye, Y. A., & Schweitzer, H. 2019):

A scoping exercise of the different types of data pooling and subsequent analysis of their pro- and anti-competitive aspects is therefore necessary to provide more guidance. ... Later on... regulation on data sharing and data pooling may be appropriate... (in some settings) duties to ensure data access – and possibly data interoperability – may need to be imposed.

German competition law now recognises data access to be an important competition issue. Data sharing can be mandated as long as the concerned data is crucial to conduct business in a given market and the data cannot otherwise be obtained easily. This is a very positive development. The only problem is that – if a forward looking view is taken of what a digital and platform economy really is – it should be evident that, practically in every sector, core sectoral data monopolised by the dominant platform(s) is both necessary to undertake similar business in that market, and the same data cannot be collected without duplicating the vast monopoly infrastructure set up by the incumbent, which is extremely difficult, if not impossible, to achieve. Even with a growing understanding of data centricity of a digital society, necessary data related realities seem to be erroneously treated as exceptional. Or, perhaps this is simply because of the inability of the concerned agency by itself to effectively address them head on.

Policy documents from EU's digital authorities also stress the importance of data sharing, proposing different ways to achieve it: multi-party data sharing agreement, data donorship, data partnerships, data intermediaries and data sharing by regulation. They even suggest that “data sharing can also be obligatory”. “In sectors like health, pharmaceutical, chemical manufacturing and finance, the government can regulate which data must be shared with whom and in which way.” These sectors simply happen to be the ones where criticality of data sharing has shown up early; similar requirements would arise in almost all sectors as a digital economy matures. In case of machine generated data, an EU policy document proposes ‘data producers’ rights, and possible data sharing on FRAND (fair, reasonable and non- discriminatory terms) terms.

The greatest concern and urgency about the long term digital prospects of a nation in a data and AI based society is evident in national AI strategies. These are supposed to be motivated by such a larger vision of economic and industrial development prospects and policies. These AI strategies, whether of UK,¹⁸ France (Villani, C., Bonnet, Y., & Rondepierre, B., 2018)¹⁹ or India,²⁰ focus centrally on data access and data sharing. The French AI strategy, which goes the furthest, calls for “developing an aggressive data policy [to improve access to big data]”, and seeks “government encouragement for the creation of data commons” ... “providing incentives for economic stakeholders to share and pool some of their data and even, in certain cases, enforce them to make it public”.²¹ But none of these strategies seem clear about *how exactly* they are going to ensure general access to the most important sectoral and social data held by digital corporations. The French document calls it ‘data of general interest’. Expectedly then, no progress on the ground in this regard is being seen in any digital sector in any of these countries. Lately a new UK report admits that instruments like data trusts – an anchor of UK’s AI strategy – are unlikely to stimulate competition within existing markets.²²

The Indian government has been speaking about data rights being like property rights in the industrial era (Samanta, P. B., and Ganguli, B., 2019),²³ data as a country’s wealth,²⁴ and that India would never compromise on data sovereignty.²⁵ India has also used the term ‘data for development’ at international forums²⁶ and in its draft

18 Department for Business, Energy & Industrial Strategy and Department for Digital, Culture, Media & Sport. (2018). Artificial Intelligence Sector Deal. *HM Government*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/702810/180425_BEIS_AI_Sector_Deal__4_.pdf

19 *For a meaningful artificial intelligence: Towards a French and European strategy*. Conseil national du numérique. Retrieved from https://www.aiforhumanity.fr/pdfs/MissionVillani_Report_ENG-VF.pdf

20 NITI Aayog. (2018). *National Strategy for Artificial Intelligence*. Discussion Paper (June 2018). Retrieved from http://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf

21 Supra n 21.

22 UK Government (2019), ‘Unlocking Digital Competition: Report of the Digital Competition Expert Panel’. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf

23 ET Exclusive: Will make India a better place to do business, says PM Modi. *Economic Times*. Retrieved from www.economictimes.indiatimes.com/articleshow/70636196.cms

24 Press Trust of India. (2019). Data a ‘new form of wealth’, needs to be taken into account: India. *Business Standard*. Retrieved from https://www.business-standard.com/article/current-affairs/data-a-new-form-of-wealth-needs-to-be-taken-into-account-india-119062801483_1.html

25 TNN. (2019). ‘PM Modi won’t compromise on data sovereignty’. *The Times of India*. Retrieved from https://www.business-standard.com/article/current-affairs/data-a-new-form-of-wealth-needs-to-be-taken-into-account-india-119062801483_1.html

26 Press Trust of India. (2019), *ibid*.

e-commerce policy, implying a country's prior right to use its data for its own development.²⁷ The e-commerce policy also mentions community data, and preferential sharing of such data with the domestic industry. However, very different views on these issues, including localisation of data, keep emanating from different sections of the government.²⁸ There is uncertainty whether data issues belong in the commerce, industry or IT department (Jalan, T., 2019).²⁹ There seems to be little clarity yet about what data policies and actions are actually required, and how they will operate. Many existing, and quite promising, data infrastructures related programmatic activities remain unconnected to policy level work.

The case for mandated data sharing is clearest with regard to data required for public interest purposes. Policy making, governance and providing public services may soon become impossible without access to data held by platforms. India's NITI Aayog's AI strategy discussion paper calls for obligatory data sharing for public interest purposes.³⁰ Similar proposals are regularly expressed in EU policy documents.³¹ On what basis a data corporation's main asset – which it considers more or less to be its private property – will be summoned to be shared however is not made clear.

Political economy of data regimes

We saw how many internal EU policy documents stress data access and even mandatory sharing of data. At global trade forums, however, the EU vigorously promotes free global flows of data, as long as privacy protections are in place

27 'India's data for India's development' is also the sub-heading of India's draft e-commerce policy where too privately collected data is the focus. See Department of Industrial Policy and Promotion. (2019). Draft National E-Commerce Policy. Retrieved from https://dipp.gov.in/sites/default/files/DraftNational_e-commerce_Policy_23February2019.pdf

28 Ministry of Finance, Government of India. (2019). Data "of the people, by the people, for the people". *Government of India: Economic Survey 2018–19*. Retrieved from https://www.indiabudget.gov.in/economicsurvey/doc/vol1chapter/echap04_voll.pdf

29 Finance Ministry wants data provisions out of E-commerce Policy; says data protection bill already in works. *Medianama*. Retrieved from <https://www.medianama.com/2019/05/223-wants-data-provisions-out-of-e-commerce-policy/>

30 NITI Aayog (2018), *ibid*.

31 European Commission. (2019). Guidance on private sector data sharing. Retrieved from <https://ec.europa.eu/digital-single-market/en/guidance-private-sector-data-sharing>

(O’Donoghue, C., and O’Brien, J., 2019).³² It is not clear how obligatory data sharing can be enforced when data flows freely, and often immediately on collection, to outside of a jurisdiction’s boundaries. And how those digital companies that do not have a physical presence in the EU will be obligated to share data, when EU also supports ‘no local presence requirement’ provision in global trade proposals. Evidencing the muddle, the French AI strategy calls for “a strong legal control of (data) transfers outside of the EU borders”.³³

A report of Germany’s Federal Ministry of Economics and Energy observes (Schweitzer, H., Haucap, J., Kerber, W., & Welker, R. 2018):

“...particularly (for) data-rich companies – a market-share-based “data-sharing obligation” should be introduced (“data-for-all” law / “data sharing” obligations as proposed, inter alia, by Victor Mayer-Schönberger). We consider this to be an important discussion. Yet, the way in which such a data-sharing-duty could be structured (and limited) in concrete legal terms is still a completely open issue.”

Whereas the main formulation here is quite interesting, and throws light on the emerging thinking across Europe, perhaps most instructive is the last sentence. For all the pious hopes, declarations and exhortations for data sharing, no one really seems to know how it will actually be achieved. The discussion in the last section was meant to show the degree of confusion on this subject among policy makers across the world, but also the unmistakable disquiet that they feel about the current digital economy model centred on private data hoarding being unsustainable.

Policy proposals often consider data sharing as an exceptional requirement, which can *somehow* be ensured when and where required. This is certainly not the case. Sharing of core sector data³⁴ is almost universally a central, and not exceptional, digital economy need today. It is *the* key point of departure, for exploring any alternative to the currently

³² EU sets out its eCommerce and privacy stall in WTO negotiations. *Reed Smith LLP*. Retrieved from <https://www.lexology.com/library/detail.aspx?g=741a038c-1b7e-4c9c-a798-33a5d179bbcb>

³³ *Supra* n 21.

³⁴ Data with special social significance are named differently in different country policy documents. The French AI strategy uses the term ‘data of general interest’, China calls it ‘important data’ and India’s draft e-commerce policy employs the term ‘community data’.

dominant Silicon Valley model of digital economy – with vertically integrated sector monopoly platforms commanding every sector of the economy with full control over its data. Equally fallacious is the belief in any kind of meaningful voluntary sharing of key sector data, other than at the margins which big players may find harmless, or even useful, to share.³⁵ Voluntary data sharing will certainly not unlock competition in different digital sectors. If it were to, such data will obviously never be voluntarily shared. Neither are global digital corporations going to sell their core data assets, just because some protected, well regulated data markets are set up, as envisaged in many AI strategies.

With these propositions being so self-evident, the continued pursuance of such half-hearted data and AI (non)strategies may be baffling. There can be three reasons for it. First is that the EU especially is not politically yet willing or ready to so dramatically part ways with the dominant Silicon Valley model propagated so zealously by its key geo-economic ally, the US. And this model is fundamentally built on exclusive access to, and therefore non sharing of, data. Under the shadow of this major high-level political dilemma, individual EU agencies are developing the propositions and models that they plausibly can. Even with their contradictions and half-measures, such models would contribute to relatively quicker possible action and going forward if and when the required political decisions get taken. Such a moment of reckoning may arrive sooner than many expect.

The second reason is a connected one. Seeking open sharing of the key resource of top global businesses, which are increasingly at the head of global value chains, is in any case a huge economic and political economy disruption. Carrying on with EU's case as illustrative of the general situation; even within EU's political economy thinking this requires far clearer understanding, and much stronger will for disruptive decisions, than exists today. These requirements can only be met at the highest levels of the government. Such steps also carry some economic risks, especially in the short term. Meanwhile, it is certainly not a task that individual agencies by themselves are up to; whereby they are doing the best that they can under the circumstances.

³⁵ See for instance, Facebook's "data for good" initiative (<https://dataforgood.fb.com/>) or Uber's Uber Movement initiative (<https://movement.uber.com>).

A, legally-sustainable, wide mandate for sharing the core digital economy resource of data will first require a framework national policy and law that institutes important social data as a special kind of national and common resource. Such common data could be that arising from people, communities, public goods/devices/spaces, and the nature, and be the subject of corresponding community data rights. This kind of a broad legal change, however, to repeat, can only be achieved from the highest political level. National data and AI strategies often circle around such a proposition, but mostly do not take it head on.³⁶

A fear may also exist that shifting to data sharing regimes can make the digital economy collapse. This need not be so, especially if undertaken carefully, in a calibrated manner. With important social data made a relatively shareable resource – while a lot of data still remains private – digital companies will shift to other areas of comparative advantage, away from hoarding social data, to applying commonly available data in the most innovative ways for fashioning new intelligent services.³⁷ Enough incentives for data collection can meanwhile be devised.³⁸ All this will indeed mean a significant shift in the current digital economy model. It involves important economic, social, political and cultural choices that a society will have to make for itself, which will set its digital future in historical terms.³⁹

And the third reason – perhaps the most amenable currently – is that in order to institute effective and workable data sharing regimes, it requires adequate prior conceptual and theoretical work on economic governance of data, beyond privacy protections. There has been little, if any, academic exploration in this regard. The rest of the paper is devoted to this task. It examines and advances some conceptual directions and possibilities for anchoring new data governance frameworks. These are hopefully both pragmatic as they can enable the required basic digital economy shifts, breaking the current data policy logjam.

36 See for example India's e-commerce policy (https://dipp.gov.in/sites/default/files/DraftNational_e-commerce_Policy_23February2019.pdf), Rwanda's National Data Revolution policy (<http://statistics.gov.rw/publication/rwanda-national-data-revolution-and-big-data>) and Maori data sovereignty (<https://www.temanararaunga.maori>).

37 Something similar happened over a period with software, with big digital corporations shifting from selling proprietary software to innovating services around open source software.

38 Some such incentives are discussed in Bing Song's article 'Big Data as the next public Good', Washington Post (2018) at <https://www.washingtonpost.com/news/theworldpost/wp/2018/05/02/big-data/>

39 The two horse global AI race between US and China does not bode well for the world, and every country needs to be concerned were it will be placed in these new configurations. For instance see, <https://time.com/5673240/china-killer-robots-weapons/>

Part 2 – A ‘data commons’ response

Digital society as intelligent social systems

It is difficult to find meaningful definitions of digital economy. It is often defined circularly as an economy based on digital technologies,⁴⁰ which still begs the question of what constitutes ‘digital’. Basing a social paradigm’s definition on a set of technologies is even otherwise unsatisfactory. Computing technologies have been around for decades, and also pretty strongly absorbed in economic activities. Business literature makes a distinction between old fashioned IT and ‘digital’, associating the latter with a new set of technologies, like mobile applications, social media and data technologies.⁴¹ The way the term ‘digital economy’ is generally employed, it denotes some significant business shifts – advent of platforms, for instance – that shaped up properly only in the second decade of this millennium. One characteristic common to all these key shifts is the involvement of data and data-intelligent technologies.

In popular media, references to data based society are now increasingly being replaced by AI-based society. Data became the buzzword early, with big data based data analytics providing powerful insights. But more mature intelligent technologies, now collectively called AI, were soon to take the centre stage. AI’s extraordinary power in human affairs can be gauged by the dire predictions made by people as diverse as late Stephen Hawking and the digital entrepreneur Elon Musk, that AI could spell the end of humanity.⁴²

The connection between data and AI is evident; data is what feeds the most important kinds of AI. Before exploring a socio-economic analysis of the resources of data and AI, it might be useful to consider a more social term rather than the technical ‘AI’. AI is a class of technologies, rather loosely clubbed. We prefer an alternative term, ‘digital

40 See an illustrative digital economy definition here https://www.sciencedaily.com/terms/digital_economy.htm

41 For instance in this business blog at <https://www.global-learning-development.com/2017/07/25/smac-4-levels-digital-business/>

42 See Cellan-Jones, R. (2014). Stephen Hawking warns artificial intelligence could end mankind. *BBC News*, 2, 2014. Retrieved from <https://www.bbc.com/news/technology-30290540> and Piper, K. (2018). Why Elon Musk Fears Artificial Intelligence. *Vox*. Retrieved from <https://www.vox.com/future-perfect/2018/11/2/18053418/elon-musk-artificial-intelligence-google-deepmind-openai>

intelligence.⁴³ Digital intelligence covers all intelligent digital technologies – from data analytics to advanced machine learning, and beyond. Further, digital intelligence is not just the underlying technologies but also the associated business, economic and social processes that together act and impact as the ‘digitally intelligent agent’. Such socially-construed factors are more amenable to fruitful socio-economic analysis.

The term AI also has the problem of anthropomorphic obsession, which distracts from how these technologies actually operate and impact. Intelligent technologies are much less discreet than normally taken to be,⁴⁴ and act in large, complex systems that make intelligent predictions and auto-execute a good part of them. Consider the simple act of shopping on Amazon and how a mix of intelligent techno-enabled processes throw up personally tailored product catalogues and also dynamically set the prices. The entire transaction may be intelligently automated and finalised without human intervention, right up to placing orders with merchants or warehouses, activating the logistics provider, and closing the payments and delivery loop.

Data based digital intelligence should be seen not just as embedded in one particular product, service or process – which it might separately also be – but as running whole economic systems, and/or sub-systems. Consider, for example, digital transformation of urban transportation as culminating in autonomous cars plying through an Uber like intelligent network. Such an economic system would require simultaneous application of many kinds of AI capabilities, like machine vision, sound recognition, natural language processing, motion control and so on, along with some more specific transportation sector related ones. This entails a superimposed and networked application of many discreet forms of digital intelligences in systemic ways, in a manner quite unlike how human intelligence operates.

Keeping a keen eye to the future is key to understanding the current early formative stages of digital economy. Whether it is a door that opens because it ‘recognises’ you, or an autonomous car turning up at your house precisely in time to get you to the airport having

43 UNCTAD (2019), *ibid*.

44 Council on Extended Intelligence set up by IEEE Standards Association and MIT Media Lab, website write up at <https://globalcxi.org/>

‘interacted’ with your personal AI assistant, it is systemic digital intelligence at work. Whether transport, food, commerce, education, health, agriculture, entertainment or any other socio-economic sector, each will be managed by networked digital intelligence running and coordinating its various sub-systems, and the involved actors.⁴⁵

Digital economy can be defined as consisting of digital intelligence run economic systems, activities and processes – sector-wise, as well as general, which together present an entirely new paradigm of economic relations and organisation from those of the industrial age economy. Corresponding to mechanisation of economic processes as defining the industrial economy, we can consider their intelligencification as underlying a digital economy.

The core competency of Uber and Amazon, for instance, is basically being the ‘brain’ respectively of the vast transportation and commerce ecology that they manage and control. These ‘digital intelligence’ or ‘brain’ corporations need not own and run any physical assets and operations; they may not even be in the same country where these physical operations take place. Their centrality to our economic and social futures is easily proven by how global finance is putting its bets on them. A little over a decade back, the top companies globally by market capitalization were oil or industrial giants; today seven out of the top eight are digital companies (Desjardins, J. 2019).⁴⁶ It has been estimated that, in ten years, Waymo, Alphabet’s autonomous car unit, may be valued at more than the combined value of Ford, GM, Fiat-Chrysler, Honda and electric carmaker Tesla (McGee, P. 2019).⁴⁷ What Waymo does today is to just order vehicles from Chrysler and Jaguar — effectively turning them into suppliers — and then fitting them out with self-driving software and hardware built in-house – a veritable ‘brain’.⁴⁸ Most investment is evidently flowing into intelligent networks and ‘brains’ of economic systems, because they represent concentrated economic power of the future.

45 This picture has no intention to minimise or undermine human agency. It just attempts to focus on the important changes that underlie a digital economy with a view to build the needed understanding of it.

46 A Visual History of the Largest Companies by Market Cap (1999-Today). *Visual Capitalist*. Retrieved from <https://www.visualcapitalist.com/a-visual-history-of-the-largest-companies-by-market-cap-1999-today/>

47 Robotaxis: can automakers catch up with Google in driverless cars? *Financial Times*. Retrieved from <https://www.ft.com/content/dc11194-2313-11e9-b329-c7e6ceb5ffdf>

48 *ibid.*

The real resource at the core of digital economy, and its new relationships, therefore is digital intelligence. This intelligence is built from data. Data is something inherent in the concerned social relationships, left as digital traces over platforms from where it is collected and processed by digital companies.

An obsession with casting the problem as centrally being of ‘machine versus human’ is another problem with the anthropomorphic AI term, which sentiment animates much popular writing. The original socio-economic problem is of human versus human, and their groups versus one another. This issue still needs to remain central to socio-economic analysis of the digital society and economy – how people and groups use AI to exercise and accumulate power, and how people and groups are subject to such power?

Like the industrial economy before it, digital economy is not a sector. It is a paradigm that cuts across the entire society. It may be early times, but digital economy’s logic is already a powerful force and factor everywhere, affecting and changing nearly everything, across all sectors. Even those not digitally connected are impacted by it; for example, a shopkeeper closing down due to competition from e-commerce platforms, or the terms of employment of a logistics runner getting changed. Unlike the communities of techno-utopian accounts – in their virtuality (Barlow, J. P., 1996),⁴⁹ or even the tentative and selective social-ness of networked individualism,⁵⁰ digital society and economy, by and large, still concerns and is constituted of real, territorially rooted communities.

The digital economy undoubtedly has a strong global element, with many applications and services organised globally. However, an overwhelming proportion of social and economic relationships or community dynamics are still very local, and will remain so. Digital systems operate in a hierarchically-nested as well as networked forms, from global to local levels.

49 A Declaration of the Independence of Cyberspace. Retrieved from <https://www.eff.org/cyberspace-independence>

50 ‘Networked Individualism’ defined by the Dictionary of Social Media, Oxford Reference at <https://www.oxfordreference.com/view/10.1093/acref/9780191803093.001.0001/acref-9780191803093-e-878>

Institutional analysis of data and intelligence

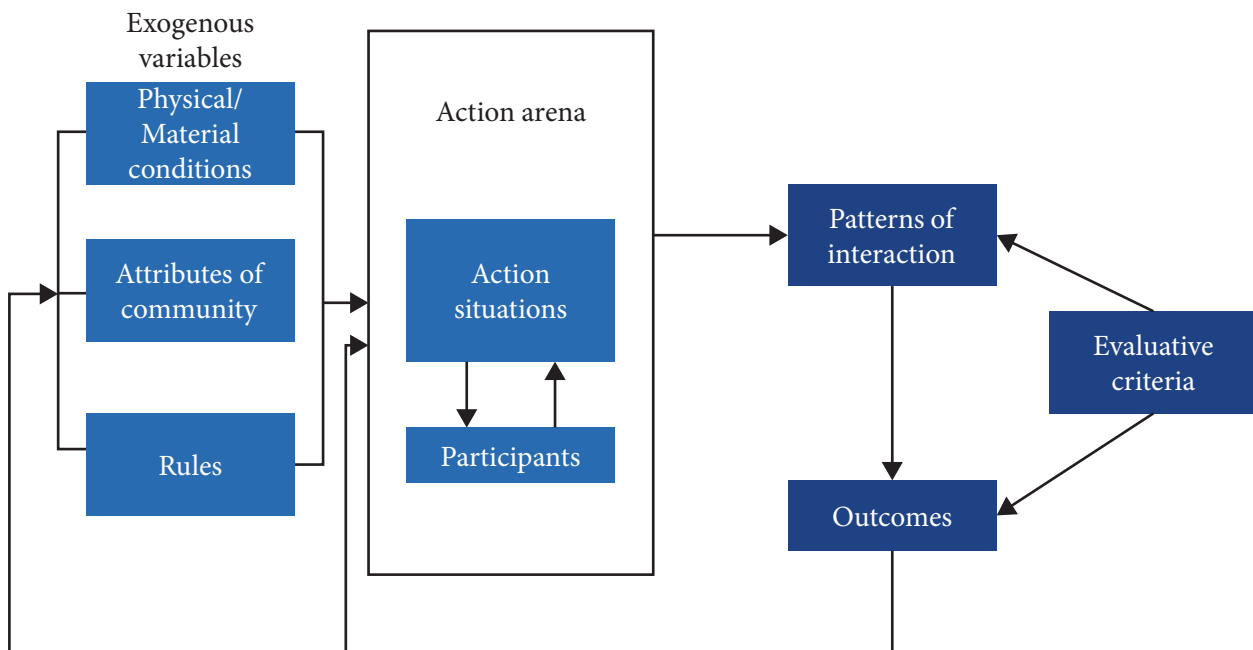
Digital economy has mostly been viewed, discussed and analysed in a global-to-local manner. The local is largely seen as a satellite operation and adaptation of what is taken to be essentially a global phenomenon. This way of looking at and construing digital economy – its concepts, designs and vocabulary, however, is just a contingent historical development. There is nothing natural or essential about such a view of the digital economy/society phenomenon, or about its global-to-local architecture.

Real social and economic life is first local, even as it connects upwards to national, regional and global levels. Addressing the shortcomings of the dominant digital model requires it to first be put upside-up, and examining it primarily from micro- and meso- social relational levels. Studying and assessing digital economies' new relationships and impacts from these vantages is likely to throw up the needed remedies to their numerous problems. It will then contribute to recognising national and global implications of the digital economy, and developing the necessary policies. This is the key theoretical point of departure that this paper attempts to take from the currently dominant construction of digital economy.

Elinor Ostrom's Institutional Analysis and Development (IAD) framework has been successfully deployed for examining governance of various resources (Ostrom, E., 2011). Such an analysis around the key digital economy resources of data and digital intelligence would involve explorations around the nature of the implicated resources, the kind of social relationships and community around it, and the set of formal or informal rules determining such relationships. For deeper insights, specific actions in given action situations will need to be studied to explore patterns of interactions and their outcomes. These outcomes can then be evaluated, including with the aim to design alternative resource governance models that could be more optimal.

Very little theoretical work exists on the core resources powering a digital society and economy, and how they act to form these new social and economic paradigms. Is the key resource data, or is it AI, and how exactly do they shape a fundamentally new set

Figure 1: A basic Institutional Analysis and Development (IAD) framework



Source: Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal*, 39(1), 7–27.

of social and economic relationships? Financial Times called data as a new factor of production, while Accenture thinks it is AI.⁵¹ Both, and much other writing, though do testify to these being the key resources of a digital economy. The earlier section examined in detail the nature and relationship between these key resources, which is an important first step of an Institutional Analysis and Development (IAD) framework.

Before further applying this IAD framework to a community’s data and digital intelligence systems, two framework issues peculiar to analysing these resources may be mentioned. These will inform development of a somewhat modified IAD framework for data and digital intelligence.

One problem with analysis of digital society issues is that – currently – these are exceptionally fast changing, whereas most considerations try to take and analyse a snap-shot contemporary view of it, or even a somewhat older one. What is actually visible in these times of very rapid flux may be less important than where it is headed, and what it is pointing towards.

51 Financial Times (2015) , ‘Why Big Data is the fourth factor of production’, at <https://www.ft.com/content/5086d700-504a-11e2-9b66-00144feab49a>. Accenture (2016) ‘Artificial Intelligence is the Future of Growth’ at <https://www.accenture.com/in-en/insight-artificial-intelligence-future-growth>

In undertaking an institutional analysis of a community's data and digital intelligence, it is therefore important to look more at tendencies and forward-pointing directions than just actors, activities and outcomes, and their patterns, in a static manner.

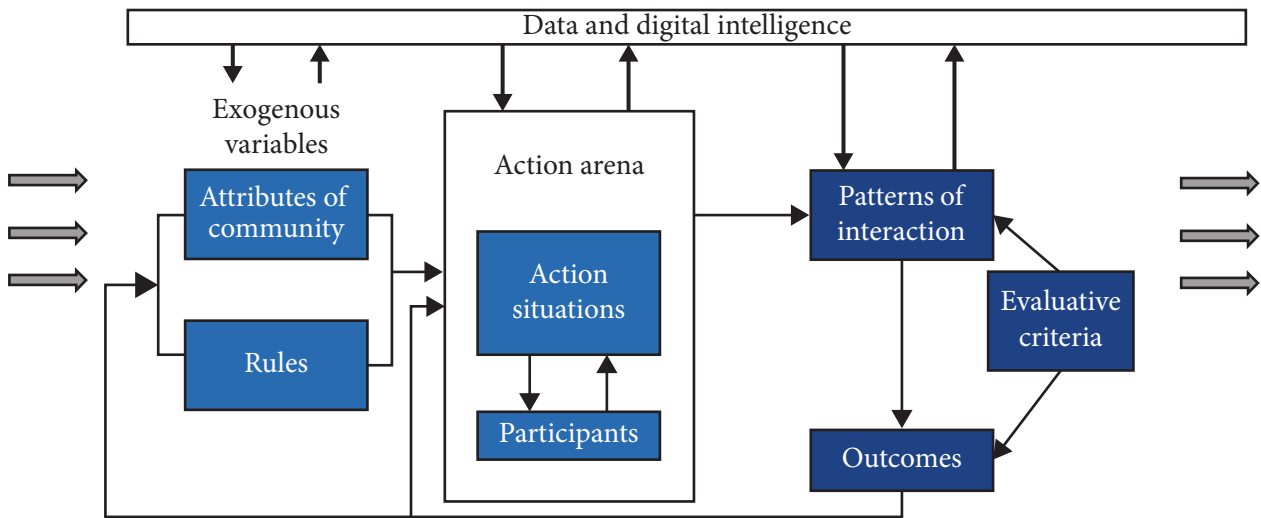
The importance of such a forward looking analysis can be assessed from how key actors, like the platform company, and its investors, are largely motivated by future gains – in structurally changed situations – more than the present. For instance, a central element of our ensuing analysis of a city's data-based transport system, the price of a ride, has a strong relationship to the fact that digital transport corporations are losing billions of dollars because of price-discounting, supported by their investors, with an eye to future monopoly, locked-in, digital transport structures. The intentions and actions of these actors, and much else of what is happening, cannot be understood unless such a forward looking view is taken. This must be situated in appropriately developed extrapolations to future scenarios, as a deliberate and prominent element of any analysis.

A second framework condition, even more unique to data and intelligence analysis, pertains to how standard IAD frameworks consider the implicated resource, the community and the rules as exogenous factors that apply to the action arena. The latter being “the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action situations)”⁵² The IAD framework was first developed and used for natural resources, which are relatively given and fixed, although the framework has also been applied to areas as diverse as knowledge commons, infrastructure, property rights, donor-recipient relationships, public housing, non-profits, social dilemmas, peace and national building, and foreign aid (Ostrom, E., 2002).⁵³ Unlike for natural resources, and many other contexts, data and digital intelligence are essentially and *purely* social resources. They are dynamically generated, as well as applied and re-applied, by the actors and actions that constitute a society or community – in unending, often escalating, cycles.

52 Ostrom, E. (2011), *ibid*.

53 See, for example, *Aid, incentives, and sustainability: an institutional analysis of development cooperation. Main report*. Sida. Retrieved from <https://www.oecd.org/derec/sweden/37356956.pdf>

Figure 2: Modified IAD framework for data and digital intelligence



In the circumstances, resources of data and digital intelligence cannot be considered as an exogenous factor. They are very endogenous to the processes of their own appropriation, use and impact, and considerably co-constructed as ‘individuals interact, (and) exchange goods and services’. They both arise from, as they enter, ‘action situations’ and ‘patterns of interactions’, which are elements of the standard IAD framework.

Presented below is a modified IAD framework as applied to the resources of data and digital intelligence. Data and digital intelligence as the implicated resource shifts from being under exogenous variables to a top box in endogenous interplay with all the vertical columns. Thick arrows on the extreme left and extreme right simply indicate the rapid flux, and the need to always consider forward-looking scenarios.

City’s transport platform under a lens

Having scale as well as manageability, a city community can serve as a good unit for digital economy institutional analysis. A ride-hailing, food delivery, travel, e-health, e-education or any other sectoral service company operating in a particular city can be examined. Below is an illustrative analysis of digital services provided in a city by ride-hailing digital platforms.

Ride-hailing companies are generally a monopoly or duopoly running practically the entire taxi system of a city. They have tended to expand to and include other areas of city transportation, from cycles, scooters and three-wheelers to buses. The plan of any platform transport company is to, more or less, run the entire transport sector of a given city – not just moving people but also physical goods, employing the constantly enlarging and deepening local transportation related digital intelligence.⁵⁴ The latter is built from continuous inflow of data from more and more actors and activities in the sector that the company increasingly coordinates. The ultimate aim is to run AI powered networks of autonomously driven cars, and other transport services – to the extent local labour costs render most optimal to do, through centralised transportation intelligence or a ‘brain’.

Two key kinds of actors are on digital transport platforms; commuters seeking transport services and those offering them.

At the first level, *i.e.* initially, the digital transport company has data collected about commuters and service providers, which is used to begin linking them. Till this time it just involves the simplest form of information, about the demand for service and its availability, with the company connecting the two and charging brokerage. As commuters and taxi drivers activate and use their respective applications, real time data keeps flowing into the platform’s systems, rapidly developing its intelligence; about each commuter and different categories of commuters; each driver, and different kinds of them; city traffic conditions, with its temporal and spatial patterns and variations; city transportation infrastructure; the implicated natural phenomena; and so on. Apart from the data from commuters and drivers using its application, which by far is the major part, the company collects and/or buys data from many other sources as well. Significantly, almost all the important data that it possesses comes from outside the company’s own internal systems. It is mostly data arising from the larger community space – from the commuters, drivers and cars, public infrastructure, and

⁵⁴ The Verge (2019) ‘Inside Uber’s Plan to Take Over City Life with CEO Dara Khosrowshahi’ at <https://www.theverge.com/2019/9/26/20885185/uber-ceo-dara-khosrowshahi-interview-exclusive>

the natural environment. This data is unilaterally appropriated and converted into digital intelligence which is the main asset and resource of the platform company. It constitutes almost the company's entire value, apart from the future bets that investors place on such digital transport intelligence, and its duly enlarged and more potent forms, to become even more valuable.

In the present case – and generally for digital economy's community based services – it is important to recognise how (1) the central resource and factor in operation is digital intelligence, and the data that builds it, with economic relationships centrally revolving around either application of such intelligence or collection of data, or simultaneously both, and (2) the company itself often operates somewhat invisibly from the involved physical operations through digital applications, cloud computing etc. If one were to consider the difference between the involved local services being delivered earlier, in their traditional form, and what is now digital about them, one can fix on these key elements. These therefore form the pivot of institutional analyses of digital economy services and systems.

Drivers benefit from the transport platform's digital intelligence in getting the greatest possible uptime for their vehicles, and, to a lesser extent, also from getting trips to legitimately preferred destinations, for instance, for drivers returning home. Intelligent dynamic pricing can get them paid more when driving in peak hours. Platform application also provides routing and other very beneficial informations. After a certain critical point, the platform effectively begins regulating traffic in the city, by determining what route each vehicle controlled by it ought to take. Commuters benefit from the platform's digital intelligence to get almost immediate taxi service from anywhere. Service is generally cheaper due to drivers managing more up-time. They are also mostly assured against refusals to do a particular trip, and about some basic minimum service conduct. These are because drivers get rated by commuters over the application, with significant consequences. Dynamic pricing may mean costlier rides during peak hours but also much better supply and availability. New useful information services are constantly added, like, for example, sharing live location of someone taking a ride that serves as a security feature and can also help coordinating meetings, etc.

Compared to their previous situation, using the platform therefore seems to be of great overall benefit for drivers and commuters. Commuters earlier had to book taxis much in advance or haggle on the roadside. Taxi drivers had few avenues to pick bookings, which meant high downtime translating into lower earnings. Benefits are especially pronounced for both these kinds of actors in the initial commuters and service providers acquisition stage, which ensures quick building up of a huge network for the platform – hopefully, a monopoly or duopoly.

In the community must also be included taxi drivers not on the platform. They seem to be suffering much loss of business, and are a disenchanted lot. Instances of violence have been reported involving attacks by these drivers on platforms based drivers (Burke, J. 2017).⁵⁵ Many of them often keep shifting to platforms, but some feel loss of their freedom and agency in doing so.

Then comes the platform company and its investors. Platforms take a cut of around 20–25 percent from the fare, a decision which is entirely and unilaterally the company's. There are no negotiations with drivers, and no trade unions. As the platform business matures, there can be considerable, unilateral, shift in the terms of engagement with drivers – to the extent that the latter's earnings could drop down to less than half.⁵⁶ Incentives, cuts, etc. with regard to driver payments can be quite arbitrary. Flexible pricing is non-transparently attributed to demand and supply, and commuters have to just pay up or forgo service. Price fluctuations tend to be high, going up to double the ground rates, or even higher.

Key investors are mostly global, and promiscuous in investing in platforms in different areas, including competing ones in the same sector, like transport. One fourth of the fare for just connecting commuters to drivers is a huge revenue for platforms, with little capital costs to incur. If transport platforms do not make humongous profits, and may even be running losses, it is because they keep discounting costs to the commuters and drivers in various ways, trying to acquire a major part of any market, preferably towards

⁵⁵ Violence erupts between taxi and Uber drivers in Johannesburg. *The Guardian*. Retrieved from <https://www.theguardian.com/world/2017/sep/08/violence-erupts-taxi-uber-drivers-johannesburg>

⁵⁶ Based on author's personal discussions with a number of Uber drivers in New Delhi.

becoming a monopoly. Intelligence has this inherent centralising quality, whereby one centre of intelligence is many times more efficient than two, or more. Monopolistic consolidation has taken place in a few important markets like China and Russia, where the number two platform transport company preferred to merge with the number one and take a stake in it.⁵⁷ This is somewhat unusual for any other, non digital, sector, especially with only two companies in competition.

For the same reason – of the inherent monopolistic tendency of data based intelligent services, investors keep throwing in money and taking losses for years. They are anticipating future monopoly profits, at times even investing in both the number one and number two in a sector, hedging their bets on which one will eventually emerge as the monopoly. The globally dominant model is therefore set towards monopoly or near monopoly (or at the most a duopoly) private digital transport system. National and local authorities have almost no influence on this larger structural configuration. Competition agencies mostly do not understand data as a resource, much less its economics, and have not been able to address this highly anticompetitive situation.

Local transport regulators are the next set of community actors. Transport, and indeed other major platform business activities like food, commerce, travel, hotels, health, etc, have always, for good reasons, been under local municipal jurisdictions. The dominant platform model, however, is presented as some kind of an inviolable global phenomenon beyond possibilities of much local influence or change (whether it is necessarily so or not is a different matter, which will be discussed shortly). A very good part of how transport platform companies operate violate all kinds of local transport rules. Regulators have had little impact on their practices.

The plight of transport regulators is a good segue to consider the important ‘rules in use’ element of IAD framework. There are, interestingly, almost no negotiated rules in practice. Rules are unilaterally set by the platform, and enforced through infallible technical means. The transport platform plays an elusive player and is never really in direct touch either

⁵⁷ See the merger of Yandex and Uber in Russia (<https://in.reuters.com/article/uber-yandex-jointventure/uber-yandex-complete-ride-services-merger-idINKBN1FR2JJ>) and that of Didi and Uber in China (<https://in.reuters.com/article/uber-yandex-jointventure/uber-yandex-complete-ride-services-merger-idINKBN1FR2JJ>).

with drivers or commuters, and mostly not even with the regulators. The virtuality and remoteness provides a take-it-or-leave-it finality to the system. This derives from the monopolistic market power that these platforms establish, but also their ability to develop and enforce rules in a foolproof manner employing the techno-structures that constitute the body of the digital system, and the means of all interactions involving it. Techno-structures are the ways that platforms and applications are technically built – and easily, and constantly, tweaked by their owners, unilaterally. These structures, and the kinds and degrees of interactions allowed by them, are entirely determined by the platform.⁵⁸ This technical architecture is also presented to be inviolably global in its essence, and not to be negotiated, audited or regulated. The only constraint on the platform is to avoid evoking too much outrage or dissatisfaction at any stage that can risk dis-engagement of actors, or a public or regulatory outcry.⁵⁹ It just has to proceed in a somewhat cautious and calibrated manner, but there really is no checking or influencing it.

Evaluating current data practices

Increasing network effect based lock-in of the involved actors to the local transport techno-system, and the even stronger and faster rising data lock-in, keep increasing the cost of disengagement relative to possible dissatisfaction with the service. At the same time, the ever enhancing digital intelligence captured by the company allows more and more useful features and possibilities that may selectively be allowed to other actors. The company therefore allures and retains other actors on the platform not by negotiating and improving the terms of engagements with them, but through added/improved technical features and conveniences and strengthening lock-ins (and thereby the cost of disengagement). Such feature/service enhancement would taper down as the digital technical ferment stabilizes, but by then the lock-ins may become virtually unbreakable.

58 It is interesting how while all such technical features and changes centrally implicate the rules in practise vis a vis local transport service, the companies still claim to the regulators that do not provide transport services but only technical services. For instance, see <https://www.wired.com/story/why-uber-still-call-drivers-contractors/>

59 Considering Facebook's monumental Cambridge Analytica scandal, these factors too do not seem to matter much to platforms. Facebook regained its entire lost market value within months of the scandal. <https://www.cbsnews.com/news/facebook-stock-price-recovers-all-134-billion-lost-in-after-cambridge-analytica-datascandal/>

As discussed, transport regulators have nearly no role in, or influence over, the terms of engagement between different actors, or regarding any other kind of rules. The terms and rules are presented – and, unfortunately, largely also received by other actors – as the general global way of doing things (made in the Silicon Valley). Any local community mostly needs to just accept and adapt to them.

Ostrom suggests a set of multiple criteria for evaluating a resource governance system; economic efficiency, fiscal equivalence, redistributive equity, accountability, conformance to values of local actors, and sustainability (Ostrom, E. 2011).⁶⁰ We will very briefly touch upon them in their application to the above discussed case of digital transport platform.

The resource here is data and digital intelligence employed to run a city taxi or transport system. The concerned platform collects data, as a free by-product of its ride brokerage activities. It then develops intelligence from such data, with very little recurring costs once various actors are intensively using the platform. If the price is set at marginal cost of use, economic efficiency dictates the price of employing digital intelligence to any given transportation situation at near zero, while currently it is about one fourth of the fare of a trip. This, especially with the monopolistic nature of the service, speaks to the public goods or commons nature of the resource of digital intelligence.

Fiscal equivalence refers to equity in terms of what one pays and what one gets. Actors on the platform contribute all the data which is not accounted for – at the time of contribution or in the subsequent value exchange. But they pay dearly for using the finished product of their own data, which is digital intelligence, which is employed to match actors, coordinate activities, set prices, etc. The price of digital intelligence, being a monopolistic service, is also unilaterally set and varied by the platform.

Redistributive equity refers to evaluating whether there is a positive bias towards the less privileged. With the company's interests exclusively dictating all parameters – generally driven by remote global actors, it can safely be said this is not even a consideration here.

⁶⁰ *ibid.*

Accountability would normally require some degree of direct interactivity with, and responsiveness from, the rules maker. The global template based remote impersonality of the transport platform is almost entirely impervious to accountability. Some technology features for selective responsiveness may work on the margins at levels aimed at preventing disengagement or public relations disasters.

About conformance to the values of local actors, the global template based remote impersonality of the system is again the key relevant point. There is very little local-ness to the platform, much less the possibility of incorporating locally articulated values through a collective or even a participatory governance system.

Sustainability in relation to the private appropriation of the very sensitive community resource of its digital intelligence by remote, unaccountable, actors is an extremely important issue, though hardly ever considered yet. A community's (disembodied) collective intelligence, which is constantly upgraded by continuous flows of data from it, is a resource that can be used in extremely powerful ways both for or against the community. Some of the worst harm possibilities consist in weaponisation of such data and intelligence for political (Nestola, E. 2019)⁶¹ or even military purposes (Tucker, P. 2014).⁶² But even just on the economic front; a monopoly company, with full community lock-ins, which is super-intelligent, say, about the transportation context, behaviour and needs of a community, is very likely to become unsustainably extractive. Instead of employing a community's captive digital intelligence for devising the best possible ways to manage its long term transportation needs – in an efficient, equitable, sustainable, accountable and value-based manner, it would be used to maximise corporate extraction in the shortest possible time.

An institutional analysis of how the resource of data and digital intelligence is being governed in a community to provide intelligent transport services indicates very suboptimal results. Similar analyses should be undertaken for platforms in other sectors.

61 Why it's too easy to manipulate voters – and steal the EU elections. *The Guardian*. Retrieved from <https://www.theguardian.com/commentisfree/2019/mar/06/digital-manipulation-eu-elections-personal-information>

62 The Military Is Already Using Facebook to Track Your Mood. *Defense One*. Retrieved from <https://www.defenseone.com/technology/2014/07/military-already-using-facebook-track-moods/87793/>

Since platforms in all sectors employ almost exactly the same basic global, Silicon Valley, template, they can be expected to exhibit similar IAD analysis results as in the case of a city's digital transport. This is especially so with respect to the two key general problematic features that our analysis threw up; (1) data based digital intelligence is employed by the mono- or duopoly platform(s) to exercise great unilateral power over all other actors that are dependent on the platform, and (2) the remotely built and controlled techno-structures underpinning these services means little accountability and local-ness.

Data and digital intelligence commons

It may be useful to explore whether alternative resource governance systems are possible for data and digital intelligence, and may be more suitable. We saw how policy makers are struggling to find appropriate alternatives, without much success. This considerably owes to the fact that little, if any, conceptual work has been undertaken to support development of new data governance and policy models. Different epistemic communities – from those involved in digital governance and knowledge politics to those from ‘traditional’ areas like competition and labour regulation – have converged on the problem from different standpoints but are unable to find effective solutions for economic governance of data and digital intelligence. The extra-ordinary novelty and uniqueness of these resources, and how they operate – a scenario that is still changing very rapidly – is considerably responsible for such a stalemate.

Taking from digital governance arena, open source software became possible due to a brilliant innovation that employed copyright law to enforce sharing of software code. A recursive licence allowed anyone to access software and its code for free as long as any further changes to it were distributed under the same conditions. A good part of global digital systems today stand upon open source software (Muilwijk, R. 2016).⁶³ This underlines the importance of having set up appropriate governance regimes for software sharing at the right time, early enough. Extension of such models to data has been suggested through

⁶³ Top 5 open source web servers. *Opensource.com*. Retrieved from <https://opensource.com/business/16/8/top-5-open-source-web-servers>

creation of ‘data commons’. Since this requires significant protections (and not just open sharing), one proposal is for a “Data Oversight Agency ... (to) ensure the availability of open-source data sets ... allow(ing) smaller companies and university labs to have as much access as large Silicon Valley and Chinese companies, spurring competition and better ensuring that more AI research will be conducted on behalf of the public interest” (Hill, S. 2019).⁶⁴

Governance regimes for sharing genomic data is another good example of how, when faced with new realities, governance systems evolve and innovate. Coming from a background of governance of public funded knowledge – concerning academics and public health, complete open access to genomic data was initially advocated. However, as the area became much more specialised and focussed on identifiable groups and communities, creating considerable harm potential if the data got inappropriately disclosed, common pool resource regimes have now been applied to it (Kamau, E. C., & Winter, G. 2013). In case of genetic resources relating to local flora and fauna, claims of special rights of the corresponding communities have been made under the Nagoya Protocol of the Convention on Biological Diversity (Buck, M., & Hamilton, C. 2011).⁶⁵ It requires that the benefits of using genetic resources arising from a particular community be fairly and equitably shared with it.⁶⁶

Alternative governance frameworks for data and digital intelligence as common pool resources should be explored. Data *arises from*, and digital intelligence *is about*, respective communities – inalienably linked to them in strong ways, perhaps no less than genetic resources are. Systemic intelligence about a community constitutes such an overwhelming power over the concerned community that it may be unthinkable to let outsiders own and control it. A possible common pool or common property regime for community’s data and intelligence can take its first cues from genetic resources governance framework, the parallel being most evident here (although significant

64 Should Big Tech Own Our Personal Data? *Wired*. Retrieved from <https://www.wired.com/story/should-big-tech-own-our-personal-data/>

65 The Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the Convention on Biological Diversity. *Review of European Community & International Environmental Law*, 20(1), 47–61.

66 <https://www.cbd.int/abs/about/> Brazil’s has claimed rights under this treaty over genetic resources of flora and fauna in its territory See <https://www.cbd.int/abs/DSI-views/2019/Brazil-DSI.pdf>

differences do exist). Genetic resources are natural, and inherent to the concerned individuals and their groups. In the wrong hands, they have great harm potential. Data and digital intelligence resources are social resources, implicit in social relationships forming a community, and an abstraction of them. In wrong hands, they can also cause great harm to the concerned community. In any case, their management in an appropriate manner is necessary for efficient and sustainable running of the digital economy and its various sub-systems, and fair allocation of benefits to different actors.

Any such formulation tends to evoke an immediate reaction that data is an inexhaustible, non-rival resource and trying to shoe-horn it into frameworks meant for scarce and rival resources can only undermine its enormous value for all. It was discussed how genomic data was first considered as an open resource, mandating open and free access for all. But later, with emerging complexification of its nature and application, at least some of this data now gets treated under more contained common pool regimes. Similar, and even steeper, conceptual evolution is required in order to emerge out of the early understanding of social and community data just as useful general knowledge about human and social affairs – which should therefore be openly available to anyone to employ – to recognising much of data and digital intelligence as situated and contained community resources – with considerable potential of harm and differential benefit, and thus contested possibilities of control and ownership.

It was discussed how data's key value is in the close and systemic digital intelligence that it provides, which, generally and considerably is about specific communities and groups (if not individuals). Even anonymised data needs firstly to be protected for this reason against possibilities of group or collective harm, and therefore cannot simply be subject to open access regimes (Bloustein, E. J., & Pallone, N. J. 2018).

Further, we discussed how digital intelligence's value arises from its – often real time, and even autonomous – application to real world physical systems. Digital intelligence services are fully rooted in such community based systems, even if they may have national or global connections. These physical systems, especially their control, is very much a rival good. They pertain to real world, rival, physical goods, services, etc. If one digital platform

becomes dominant in a sector in a given community, there is often little space left for another one to develop even if it had all the access to required data. Even if a second competing platform is somehow able to be set up, the possibilities of a third and fourth, and so on, drop precipitously. In fact, it is not data or digital intelligence, in and by itself, that has to be considered as the ‘resource’ under an IAD framework: the relevant ‘resource’ is a ‘unit digitally intelligent system’ that is able to deliver useful intelligence services. It is such an operational resource system that is sought to be subject to a common pool regime, and its constraints. Such resources systems are obviously rival. They are even more so between actors within and outside the community. The former have a stake in, and possible accountability to, the community, which is likely to be absent or very weak for outside actors.

This establishes why, in most situations, data and digital intelligence cannot simply be treated as inexhaustible, non-rival resources and thereby subject to normal open access regimes, as for example happens, or is considered desirable, with regard to many knowledge resources. The value of data and digital intelligence may not only deplete, and be subject to over-use, it can turn negative, as discussed. Congestion and rivalry too occur prominently in the manner that these resources are actually applied in service provision contexts.⁶⁷ All these factors and conditions make the case for treating much of community data and digital intelligence as common pool resources, and accordingly subjecting them to common property regimes.⁶⁸ In many ways, therefore, community data is like renewable, but possible to over-exploit, deplete and pollute, resources like pastures, forests and fishing reserves. Data has been compared with the scarce public resource of spectrum (Philip N. Napoli 2019).⁶⁹

There can, however, be many kind of general data that do not sufficiently meet these ‘common pool resource’ conditions and are better treated as open access resources. Depending on the type of data, context, etc, the actual nature of social or community

67 Possibility of over-use, depletion, rivalry and congestion are the factors that distinguish common pool resources from resources that can simply be made available as open access. See https://en.wikipedia.org/wiki/Common-pool_resource#cite_note-EED-2

68 The term “common property regime” refers to a particular social arrangement regulating the preservation, maintenance, and consumption of a common-pool resource. http://en.wikipedia.org/wiki/Common_Property_Resource

69 What Would Facebook Regulation Look Like? Start With the FCC. The Wired. Retrieved from <https://www.wired.com/story/what-would-facebook-regulation-look-like-start-with-the-fcc/>

data may fall somewhere in-between being an open access resource and a common pool resource. Data commons are therefore a very special kind of commons, requiring certain *sui generis* treatment.⁷⁰ Data governance frameworks should be mindful of this fact, especially about the need for necessary and appropriate data related protections and safeguards of various kinds. This is apart from many kind of private data – personal as well as organisational – that would not fall under either of these two regimes.

For these community data and digital intelligence resources to be common pool, it firstly requires instituting a clear policy and law ordaining as much. Without these, it will not be possible to get access to, much less exercise effective control over, community data that is collected and appropriated by corporations, because the latter consider such data as their private key economic asset. It becomes a hotly-contested core economic issue like the ones that involved old-fashioned property rights to, and ownership of, land and other physical assets. In knowledge governance, laws were employed to gate-keep rather than share knowledge. In case of community data, that is kept locked in private techno-structures, communities need the enablement of law to be able to access, use and control their own data assets. This important difference is worth pondering upon. A basic framework law must legally institute and clarify the relevant community's primary economic rights over data and digital intelligence about, or pertaining to, it.⁷¹ It will layout an appropriate common property regime for data and digital intelligence, as is normally associated with governing common pool resources.

It may mean mandating corporations collecting community data to share the required data, as appropriate, through proper means and processes, like data trusts, data infrastructures, and even data markets, possibly operating on fair, reasonable and non-discriminatory (FRAND) terms. Within community's primary data rights, different kinds of data rights can be allocated to various actors, including platform companies, to – and in the ways that can – best meet the IAD evaluatory criteria of efficiency, fiscal equivalence, redistributive equity, accountability, conformance to local values and sustainability.

70 UNCTAD's Digital Economy Report, 2019, seeks *sui generis* approach to governance of data. UNCTAD (2019), *ibid*.

71 Maori data sovereignty, Rwanda's data sovereignty policy and India's draft e-commerce policy, *ibid*. The French AI strategy also refers to sovereignty for data protection (*ibid*).

In the transport sector that we discussed, it may be possible to employ shared community data to run some kinds of transport ‘platform cooperatives’ of drivers (Anzilotti, E. 2018).⁷² To succeed, such efforts however require support from the formal rules environment – local, national to global (Kelsey, J. 2018).⁷³ It is equally likely that the best way may be to encourage and support local (or national/regional/global) private digital businesses to operate with some licensed exclusive data rights allocated to them, so as to tap the value of entrepreneurship, and at times perhaps also of scale. In less important sectors, such licensing may be deemed to be default, but conferring on appropriate authorities the power for suitable regulation of data and data related activities. In other, socially more important areas, licensing may need to be explicit. Many of these sectors already involve various kinds of licensing. Explicit data related obligations may also be configured as per the size and nature of an enterprise, and/or other relevant parameters, to avoid disproportionate compliance costs on small players.

Where natural monopolies are found useful to retain, the concerned business will need to be tightly regulated like utilities (Rahman, K. S. 2017). On the other hand, to benefit from efficiencies of competition, two or more companies may be licensed to operate in any given area. The natural monopoly characteristic of digital intelligence can fruitfully be harnessed by feeding these competing businesses from common open data infrastructures run by public bodies and/or as data utilities.⁷⁴

Community-to-global digital architectures

The rules-in-use aspect of common pool resources of data and digital intelligence have primarily to be locally managed. As mentioned, key services like transport, commerce, food, hotels, agriculture, health, education, etc, have otherwise, traditionally, been locally managed, for very good reasons. There is no justification why just because they are now being provided intelligently, in a digital economy framework, they need to follow some

⁷² Worker-owned co-ops are coming for the digital gig economy. *FastCompany*. Retrieved from <https://www.fastcompany.com/40575728/worker-owned-co-ops-are-coming-for-the-digital-gig-economy>

⁷³ There is a standard provision nowadays that domestic preference cannot be given for digital services. See, How a TPP-Style E-commerce Outcome in the WTO would Endanger the Development Dimension of the GATS Acquis (and Potentially the WTO). *Journal of International Economic Law*, 21(2), 273–295.

⁷⁴ This paper discusses at length the concept and practice of data infrastructures: see <https://itforchange.net/index.php/digital-industrialisation-developing-countries-%E2%80%94-a-review-of-business-and-policy-landscape>

inviolable global template, controlled tightly from a few global centres. This myth needs to be exposed, and the bluff called. The digital intelligence services model in all sectors should evolve from local requirements and contexts. Such services can very well be locally organised, and managed, even if they may rely on some back-end global services. This is likely to lead to much better outcomes on almost all evaluatory criteria associated with the IAD framework. A key design principle developed by Elinor Ostrom for managing common pool resources is to ‘match rules governing use of common goods to local needs and conditions’ (Ostrom, E. 2008).

Bringing the resources of data and digital governance under common property regimes requires that they be clearly and strongly subject to the territorial rule of law (Singh, P. J. 2018).⁷⁵ Global platforms tend to evade national and sub-national jurisdictional authority in many ways. The provisions of digital or platform services may avail global input services as required. Data and digital intelligence structures may even usefully link across the globe – in different protected, but practical, ways – to provide value for all. But these requirements will have to be managed in a different, inside-out manner, rather than the current dominant model of tight – outside in – global controls over the entire arena of activities. Many of the required IT and AI services can be made available to local digital businesses as services for fees, or other considerations, rather than having vertically integrated global AI or intelligence corporations running digital services in all communities as their satellite operations. This, as discussed earlier, leads to great collective and individual dis-empowerment. Similarly, various kinds of pooling of – or otherwise access to – data and/or digital intelligence, can be worked out to the mutual agreement and benefit of all those who pool it. It can be done nationally, regionally, and/or globally. This against the extant model of a few global corporations controlling data’s entire value on the basis of the dubious doctrine of free global flow, and appropriation, of data.

Common property regimes for data and digital intelligence can and should also develop for national, regional and global levels, whereby corresponding institutional structures will be required – like data pools, data infrastructures and data trusts.

⁷⁵ Data Localisation: A matter of rule of law and economic development. *IT for Change*. Retrieved from <https://itforchange.net/index.php/data-localisation>

Polycentricity is a concept employed in IAD frameworks. A paper describes it as: “A system of governance in which authorities from overlapping jurisdictions (or centers of authority) interact to determine the conditions under which these authorities, as well as the citizens subject to these jurisdictional units, are authorized to act as well as the constraints put upon their activities for public purposes”.⁷⁶ This concept of polycentricity seems very apt for data governance, with its logic and structures radiating from local communities outwards to national, regional and global levels (and not the other way around).

The first and the second design principles among the eight postulated by Ostrom for common property regimes are, respectively, to ‘define clear group boundaries’ and ‘match rules governing use of common goods to local needs and conditions’. The last one is to ‘build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system’.

Elinor Ostrom’s eight design principles for managing a commons (Walljasper, J. (2011))

1. Define clear group boundaries.
2. Match rules governing use of common goods to local needs and conditions.
3. Ensure that those affected by the rules can participate in modifying the rules.
4. Make sure the rule-making rights of community members are respected by outside authorities.
5. Develop a system, carried out by community members, for monitoring members’ behavior.
6. Use graduated sanctions for rule violators.
7. Provide accessible, low-cost means for dispute resolution.
8. Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system.

⁷⁶ McGinnis, M. D. (2005, June). Costs and challenges of polycentric governance. In *Workshop on analyzing problems of polycentric governance in the growing EU, Humboldt University* (pp. 16–17). Retrieved from <https://pdfs.semanticscholar.org/5914/333d3702d5fa4b277364fc3c3c8591d0d5.pdf>

Many technical possibilities exist for using data to train AI, or extensively contribute digital intelligence, even while the data stays close to its points of origin (and thus possibly under due control of the concerned data contributing and subject community), like federated learning and edge computing.⁷⁷ It is also possible for data to be transmitted and processed temporarily in virtually protected spaces across the globe, without storing it, and to provide legal protections and exemptions for such practices.⁷⁸ As digital technologies are turned to service appropriate common pool regimes for data and digital intelligence, necessary technical adaptation and innovations will further evolve. So would new legal regimes and institutions develop. We mentioned earlier in this regard data pools, data infrastructures, data trusts, and even free and open, and well-regulated, data markets.

The problem with the exhortations for free cross-border flows of data, especially by the US and its allies,⁷⁹ is that, in the current situation, they are primarily meant for global digital corporations to be able to circumvent national regulation, generally, and to preempt any economic claims over data by data contributors, specifically. We have been arguing for the precise opposite. Cross-border flows of data can, however, be allowed as long as appropriate, enforceable, international agreements are put in place that recognise and protect a community's and nation's primary rights to its data, in the true spirit of sovereignty, polycentricity and subsidiarity. Some kind of 'rule of origin' principle can be employed for managed global data flows, and the place of origin also technically stamped at points of initial data collection. Since any global agreement of this kind is unlikely any time soon, regional arrangements towards managed 'single data spaces' can be negotiated, that centrally recognise collective economic rights over their data of the communities and countries of origin. Regions like Africa, Latin America, ASEAN and the EU, may currently be good candidates for such regimes.

77 See, for example, <http://ai.googleblog.com/2017/04/federated-learning-collaborative.html> and <https://www.theverge.com/circuitbreaker/2018/5/7/17327584/edge-computing-cloud-google-microsoft-apple-amazon>

78 The Reserve Bank of India while mandating localisation of financial data has allowed a 24 hour period for taking data out for processing without storing it outside India. See <https://www.google.com/search?q=RBI+allows+temporary+processes+of+data&oq=RBI+allows+temporary+processes+of+data&aqs=chrome..69i57j33.14450j0j7&sourceid=chrome&ie=UTF-8>

79 See for instance the US policy document 'The Digital Two Dozen' which lays out its global digital trade policy priorities. <https://ustr.gov/sites/default/files/Digital-2-Dozen-Final.pdf>

Overlapping polycentricity of data governance regimes does not just work along geographic axes, but also within communities, and vertically. Some community actors have closer association with, and greater stakes in, the concerned community data systems than others. Drivers on a transport platform, for instance, both contribute much more data to it than the commuters, and have much larger stakes in its digitally intelligent operations. They should therefore have greater and special data rights, and a significant stake in the value of the transport platform. Appropriate rights can be allocated to cab drivers, as key contributors of data, and subjects of its digital intelligence, to co-determine the digital platform business (Singh, P. J. 2019).⁸⁰ This can be achieved by their appropriate participation in the governance of the platform business, like through a share of seats on the board of directors.⁸¹ Where appropriate, such a system may serve as a workable *via media* (or an additional alternative) between local taxi cooperatives and the current, unsustainable, model of vertically-integrated global digital transport corporations. Similar special data and digital intelligence based rights – and corresponding privileges for participation in the governance of platform business – should accrue to traders and manufactures whose goods sell on an e-commerce platform, to restaurants on food delivery platforms, to hotels on accommodation booking platforms, and so on.

It will be useful to conceptualise in greater detail – and also examine existing operational – models of digital platforms in various sectors running with community data and digital intelligence as a common pool resource, and subject them to the IAD framework. Such a conception and analysis will lay out the new implicated socio-economic relationships; the kinds of rules that get into use, and how they are developed and applied, and; specific action situations of how the system actually works, and produces outcomes. These outcomes can then be evaluated over various earlier mentioned IAD criteria. This is an important area for future research.

80 Ensuring decent work in the digital age: A sharing and distributed economy with a shared and distributed ownership. *Keynote speech for the thematic panel organised by the ILO on Technological Pathways for Decent Work*. Retrieved from <https://itforchange.net/sites/default/files/add/workers-rights-to-work-data.pdf>

81 Such a concept of workers participation in management exists in Germany. See https://en.wikipedia.org/wiki/Codetermination_in_Germany

Conclusion

A widespread discontent with the *status quo* of global digital economy and data exists currently. Many countries – especially those that fear debilitating relegation in the US and China led global digital and AI race – are looking at data sharing and data availability for domestic businesses as being indispensable for digital economic development and digital industrialisation. Policy makers have however been unable to make a breakthrough in this all important digital economy and data policy area. They largely remain stuck due to an absence of grounded understanding of the essentials of a digital economy and of high level political will to confront its challenges head-on. Such abdication is likely to have historically deleterious consequences.

A digital economy is about all sectors getting dominated by digitally intelligent services, which are currently run in a globally vertically integrated fashion. Much of a community's data and digital intelligence cannot be considered simply as a, global, open access resource, for anyone to freely appropriate and use. Open and free global flows of data can in fact have an inverse relationship with data sharing and availability within a country. Data's economic appropriation and use has to undertaken in a protected, controlled and regulated manner, promoting the best public interest. Greater localness and community-ness needs to be brought to data and digital intelligence, in order to counter-balance the current hyper-globalisation and (connected) hyper-corporatisation of the 'digital'. It is best to consider most of community data and digital intelligence as a common pool resource of the respective relevant communities. Constructing appropriate common property regimes around them would provide the basis and means for the required data sharing – making data actually available to domestic businesses – and for regulation of digital businesses. These are some of the most important digital economy and data policy requirements today.

References

- Autorite de la Concurrence, Bundeskartellamt; “Competition Law and data”; 2016. Retrieved from <http://www.autoritedelaconcurrence.fr/doc/reportcompetitionlawanddatafinal.pdf>
- Background on the institutional analysis and development framework. *Policy Studies Journal*, 39(1), 7–27. Retrieved from <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1541-0072.2010.00394.x>
- Combining competition and data-based approaches for regulation of digital market power, and enabling domestic digital businesses in a developing country context. *IT for Change*. Retrieved from <https://itforchange.net/sites/default/files/competition-plus-data-approach.pdf>
- Common pools of genetic resources: Equity and innovation in international biodiversity law*. Routledge. Retrieved from <https://www.routledge.com/Common-Pools-of-Genetic-Resources-Equity-and-Innovation-in-International/Kamau-Winter/p/book/9780415537674>
- Competition Policy for the digital era. *Report for the European Commission*. Retrieved from <https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf>
- Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Introduction—Platforms and infrastructures in the digital age. Retrieved from <http://ide.mit.edu/sites/default/files/publications/ISR%202018%20Constantinides%20Henfridsson%20Parker%20Editorial.pdf>
- Design principles of robust property-rights institutions: what have we learned. Retrieved from <https://books.google.com/books?hl=en&lr=&id=bcZ5CgAAQBAJ&oi=fnd&pg=PA215&dq=ostrom+design+principles&ots=OoVm8hWCBG&sig=9b88pqYZfQV3ClSy1sxLFHcyTnY>
- Duke University Libraries. The Bermuda Principles. Retrieved from <https://dukespace.lib.duke.edu/dspace/handle/10161/7407>
- Elinor Ostrom’s 8 Principles for Managing A Commons. *On The Commons*. Retrieved from <https://www.onthecommons.org/magazine/elinor-ostroms-8-principles-managing-commmons>
- European Commission Staff working Document, on ‘The free flow of data and emerging issues of the European data economy’ (2017). Retrieved from https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=41247
- European Data Portal (2019). Analytical Report 12: Business-to-Government Data Sharing. Retrieved from https://www.europeandataportal.eu/sites/default/files/analytical_report_12_business_government_data_sharing.pdf
- Guellec, D., & Paunov, C. (2017). *Digital innovation and the distribution of income* (No. w23987). National Bureau of Economic Research. Retrieved from <https://www.nber.org/papers/w23987>
- Gurumurthy, A., Bharthur, D., and Chami, N., (2019). Intelligence Economy. *IT for Change*. Retrieved from https://itforchange.net/sites/default/files/2019-09/Platform-Planet-Development-in-the-Intelligence-Economy_Executive-Summary_Sep2019.pdf
- Individual and group privacy*. Routledge. Retrieved from <https://www.taylorfrancis.com/books/9781351319966>

Modernising the Law on Abuse of Market Power: Report for the Federal Ministry for Economic Affairs and Energy (Germany). Available at SSRN 3250742. Retrieved from <https://pdfs.semanticscholar.org/ba99/aa34216249bcd6e036d8efe1f99bcb1798cd.pdf>

Singh, Parminder Jeet, Platform Planet: Development in the Evolution of Global Digital Governance: A Southern View, forthcoming, Pathways for Prosperity Commission, University of Oxford.

The new utilities: Private power, social infrastructure, and the revival of the public utility concept. *Cardozo L. Rev.*, 39, 1621. Retrieved from https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/cdozo39§ion=57

The Separation of Platforms and Commerce. *Columbia Law Review*, 119(4), 973–1098. Retrieved from <https://columbialawreview.org/content/the-separation-of-platforms-and-commerce/>

UNCTAD (2019). Value Creation and Capture: Implications for Developing Countries. Digital Economy Report 2019. UNCTAD. Retrieved from: <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2466>

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About the Author

Parminder is executive director of IT for Change. His engagements have been in the area of ICTs for development, Internet governance, e-governance, and digital economy. He has been a special advisor to the UN's Internet Governance Forum (IGF) and to the UN Global Alliance for ICTD. He was a part of UN working groups on IGF improvements and on enhanced cooperation on international Internet policies. Parminder has been a co-coordinator of the global Civil Society Internet Governance Caucus, and a founding member of Just Net Coalition and of Internet Rights and Principles Coalition.

 datagovernance.org  dgn@idfcinstitute.org

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