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Aadhaar-Led Identification and Datafication Among Informal Workers in South India*: A Data-Justice Perspective*

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Table of Contents

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2019

Abstract

Aadhaar – India's national biometric digital identity programme through its unique 12-digit number for every Indian resident – has been intricately linked to daily aspects of living in recent years. The programme aims to enable digital linkage to governmental and non-governmental services and through that achieve digital financial inclusion of groups like unbanked informal workers into the mainstream economy. This paper focuses on the Aadhaar experiences of two groups of informal workers in an Indian urban setting – cab-drivers and domestic workers. These informal workers access digital platforms like online recruitment portals and gig-economy apps which are aimed at employment of urban 'blue collar' workers, using Aadhaar as an identity for verification through its complex technological ecosystem.

Based on this evidence base, the paper provides two contributions. First, it presents a novel theoretical lens of social justice by operationalising 'abnormal justice' in a way that is synergistic with elements of surveillance and datafication inherent to digital identification. This results in a framework of data justice, enabling analysis along cultural, economic and political dimensions. Second, using this framework the paper deconstructs empirical evidence collected using semi-structured interviews and field observations. Ultimately it argues that while Aadhaar identity and the data-flow it enables has become critical in enabling digital participation of informal workers, digital identity is intimately related to inequality experienced by urban marginalised groups in three ways: current use of digital identities reifies extant cultural inequalities experienced by marginalised workers; unprotected datafication creates new economic inequalities that exploit new-found digital participation enabled by digital identities; and unfair barriers continue to exist for the marginalised under digital identity to voice 'informed consent' or to access redressal of security issues.

A. Introduction

Strong identification systems, reliable databases, and the surveillant visibility of the citizen to the state have been presented as a prerequisite to build 'a social contract between governments and citizens' (Breckenridge 2014, Diop 2017). An acknowledged issue of the socio-economically disadvantaged population is that they fall into under what Gilman & Green (2018) have called the 'surveillance gap' – the 'systemic invisibility' of certain classes within society. Based on this, particularly in the global South, identification programmes are seen as a necessity to enable hitherto disadvantaged groups to participate in socio-economic transactions (Koops et al. 2009, Bennett & Lyon 2013, Lyon 2013). Countries including India, Brazil, Ghana, Malaysia, Indonesia and China are in the active phase of implementing a digital identity infrastructure (Nanavati et al. 2002, Madanapalle 2017, Swearingen 2018).

Born out of a similar justification, Aadhaar – India's national biometric and digital identity programme – works using iris scans and fingerprints. These biometrics are used as the means of bodily verification of the individual specifically to prevent duplication of the individual's records across the national database of residents. This results in a random 12-digit digital unique identity number for the individual. Personal information like demographic data, address, mobile phone numbers and email addresses of citizens are linked to this Aadhaar number. This information is also printed on paper documents for offline use, alongside the other option of using downloaded XML data-files and QR codes which encode personal information – shared using purpose-built mobile app or through USB thumb drives.

This positions Aadhaar such that while biometric data itself is not shared beyond Aadhaar's database, verification using Aadhaar enables sharing of personal information necessary to prove one's identity. Alongside this, advanced technical capabilities of Aadhaar's architecture espouse the 'big data' paradigms of 'openness' to interoperability and 'scalability' to achieve high volumes of data (Varma 2014), and using 'application programming interfaces' (APIs) that enable digital verification. Consequently, Aadhaar functions at the core of a complex ecosystem where the digital identity verification is used by both governmental and commercial systems. Ultimately, the personal information shared via the paper document or XML data-file can be confirmed as being genuine using the Unique Identity Authority of India (UIDAI) website directly or by software integration of governmental and commercial systems that consume the UIDAI API (Viswanathan 2019).

Given such capabilities, Aadhaar and its linkages create a need to understand the impact of 'datafication' and its relation to digital identity. Datafication, defined as the transformation of social actions or outcomes into data through online quantification (Mayer-Schoenberger & Cukier 2013, Van Dijck 2014), carries the impact of identification forward in relation to the data-driven context of use of Aadhaar as digital identity. This means that despite the state not collecting vast quantities of data directly with a motive of surveillance, a move towards datafication creates data-flows that cause social impacts beyond the original intention for which data was collected (Nayar 2012). It is acknowledged that marginalised groups within India especially face a situation where their newly found digital participation makes them vulnerable to risks due to unethical practices of data use (The Wire 2017). Even when the

state seeks to address such concerns, its benefits do not always apply to the disadvantaged population due to factors like data-literacy, absence of awareness, or lack of access to redressal (Abraham et al. 2017, ET 2018a). This presents a knowledge gap of understanding issues like ethics, fairness and inequality – encapsulated as the meta-issue of justice, in relation to the use of complex surveillance ecosystem of digital identity on those who are already marginalised and are seeking a means to participate in the wider society.

The focus of this paper is in understanding the impact of datafication through the study of two aspects. First, this paper places the use of digital identity within its complex ecosystem of use and its consequent impact. Secondly, this paper contextualises the use of digital identity and its surveillance capability among the experiences of the marginalised population. To achieve this the paper studies the daily-life experiences of informal workers in south India using the lens of social justice to understand how they navigate the effects of surveillant visibility and datafication. The research question that this paper ultimately answers can be presented as: What is the social justice impact of a digital identity and the datafication enabled by it?

The paper is structured to first discuss the relevant literature from which a conceptual framework of data justice is identified. Following a brief description of the case study background and the research methods, the empirical findings from the analysis of the case are presented. Finally, the wider implications of the paper and its findings are discussed before concluding with its specific recommendations.

B. Literature

This section will briefly introduce recent scholarship on datafication, and its relation to surveillance and social justice. Building further on this a conceptual framework is developed that is to be used for the analysis of the case study under focus.

B1. Identification and Datafication

'National identity' systems developed under electronic governance utilise digital technologies to deliver an open and multi-purpose identification infrastructure and enabling linkages to other systems, adding complexity to their social impacts (Whitley & Hosein 2010). With the lack of data-protection frameworks in the global South (Arora 2016), there is a strong potential for data-led discrimination and breach of ethics in use of data where linkages of open surveillant-capable identification systems enable data-flow between the state and private entities. This has been acknowledged as an area of concern in recent scholarship calling for critical understanding of datafication and its context (Boyd & Crawford 2012, Gangadharan 2012, Lyon 2014, Van Dijck 2014, Zuboff 2015, Dalton et al. 2016, Broeders et al. 2017, Roth & Luczak-Roesch 2018). Research by Taylor & Broeders (2015) has specifically called for a new ethical approach in understanding surveillant visibility and datafication specifically anchored in the global South.

The growing corpus of work on 'data justice' – including by Johnson (2014), Dencik et al. (2016) and Heeks & Renken (2018) – brings together the varying strands of theorisation related to datafication and surveillance, using a critical and an ethical lens. Mainly – as both Johnson (2014) and Dencik et al. (2016) present outright (Heeks & Renken 2018 allude to it) – surveillance is centrally placed in theorising the 'justice' paradigm. Most relevantly Taylor (2017) has extended this to include theorisation of 'visibilities' in relation to data justice. This can also be read in the empirical works of Gangadharan (2012), who suggests the need to invoke 'social justice' as a means to understand inclusive participation predicated on digital technology and the 'complexity of what participation and incorporation into online worlds entail'. Echoing this, the section that follows conceptualises identification and datafication within surveillance theorisation.

B2. Surveillance and Recognition

Surveillance has been conceptualised by David Lyon (2010) as being 'liquid' – terming it 'liquid surveillance' – which in turn is rooted in readings of Zygmunt Bauman's (2000, 2013, and also Bauman & Lyon, 2013) notion of 'liquid modernity'. Liquid surveillance presents an argument which helps conceptualise 'identification' within contemporary society as a means of individualisation and of seeking legitimate identity through digital technologies. These core ideas are to be engaged within the experiences of the surveilled individuals. Presenting surveillance as a concept of visibilities as Lyon (2010) summarises:

> Liquid surveillance describes well today's regimes of in/visibility and is characterized by data-flows, mutating surveillance agencies and the targeting and sorting of everyone. (Lyon 2010: 325)

Surveillance is thus intricately connected to datafication enabled through technological artefacts like mobile phones, codes and passwords, digital identities and online profiles, working together to enable participation within the network (Bauman & Lyon 2013).

Under such a theorisation the social function of surveillance can be probed further as 'recognition' (Taylor 1997, Brighenti 2010, Lyon 2016). Recognition here is the means of establishing one's identity and categorisation as a demonstration of one's position within society. This notion of recognition has been co-opted by Bauman & Lyon (2013) (also see Bauman 2001, Lyon 2016) as the starting point of liquid surveillance. Legitimate identification sought by disadvantaged groups to be seen, to belong and to be counted by the state through programmes of welfare, of financial inclusion, and even of citizenship is subsumed in such a theorisation. Brighenti (2010) presents this as the need for 'individual recognition' sought by the previously disadvantaged and undocumented individual to be 'seen' by the state using regimes of identification including the use of identity cards, technological artefacts (like smart cards), and digital artefacts (like biometrics or identity numbers). This relation between identity and recognition thus presented as a socio-political notion is intertwined with issues of inclusion and marginalisation (Taylor 1997, Lister 2004) and also of visibilities and surveillance (Brighenti 2010, Boellstorff 2013, Lyon 2016). Further, the most relevant theorisation that uses 'recognition' as a core notion in relation to social justice is of 'abnormal justice' by Fraser (1998, 2000, 2009). The next section presents this as a framework within which the need for legal identity is conceptualised as 'recognition' and is a key dimension of justice alongside other contextual social factors.

B3. Abnormal Justice

Bauman (2001) invoking Fraser (1998) argues that 'recognition' must be understood with its allied economic or distributive justice factors. Fraser (2000, 2009) presents the same argument to understand complex ideas of justice with underlying dimensions as 'abnormal justice'. Here justice is achieved by equitable participation in society or 'parity of participation' – which depends on achieving parity in specific intertwined dimensions of distributive justice and recognition, echoing Bauman (2001).

Since economic subordination in a society in many cases can cause cultural subordination and vice versa, Fraser (2000) deems that considering the social role of identity as the result of a freestanding 'cultural' component in society would miss the economic component of seeking fair 'redistribution' of resources – or 'distributive' justice. To further contextualise claims to justice, Fraser extended redistribution and recognition as dual dimensions of justice by adding a third dimension of 'representation' and positing further that we live in an era of 'abnormal justice' as opposed to normal justice. Here normal justice presupposes 'parity of participation' according to normative 'social arrangements that permit all to participate as peers in social life' (Fraser 2008: 405). The parity establishes clear common understanding of the critical nodes of justice: the 'what', the 'who', and the 'how' justice can be achieved in a society. While studying participation of an already disadvantaged population within a society, this parity is not present and is sought. Under abnormal justice the 'what' of the justice is then profoundly changed. It is not just the fair distribution of resources or recognition in society. Here the 'what' is a wider conceptualisation of that which needs to overcome three societal injustices (Fraser 2009):

- Misrecognition – injustice in the cultural domain of existence where respect or esteem is unequal due to embedded cultural hierarchies. Disparity here results in unequal social standing where some individuals or groups face barriers due to cultural markers such as gender or caste.
- Maldistribution – injustice in the economic domain where the distribution of resources is unequal. Disparity in aspects like lower income, wealth, or other intrinsically-economic value markers define an economic structure of inequality between actors in society.
- Misrepresentation – injustice in the political domain where rules of participation in politico-spatial society are unequal. Disparity here creates a political voice-lessness and unequal democratic and procedural access to participation.

Overcoming the 'subordination' across cultural recognition, economic redistribution and political representation dimensions, the core objective of justice, which is 'parity', would be achieved as per Fraser (2000, 2009). These three dimensions as discussed below are presented as central to probing the impacts of digital identity and their social justice impacts.

The first two dimensions of recognition and redistribution were proposed initially by Fraser (2000). Recognition specifically zeroes in on the impetus to seek digitally enabled participation within society through surveillance artefacts (Bauman 2001, Lyon 2016), and can be read in a way that is coherent with Fraser's (2000) argument. Here the provision of an individual identity helps overcome extant cultural subordination and attain social

'recognition' (Brighenti 2010, Lyon 2016a). This understanding of identity and its role in recognition is synergistic with the role of surveillance as understood by Bauman & Lyon (2013) and Brighenti (2010) (also see Lyon 2016). But, as noted above from Fraser's (2000) work, economic subordination in a society can cause cultural subordination and vice versa. This is presented as the inevitable entwinement of the cultural and economic mode of participation, that is of recognition and redistribution – the first two dimensions of parity in 'abnormal justice' theorisation.

This entwinement of recognition and redistribution has been acknowledged by other authors. For instance, in relation to surveillance, Cinnamon (2017) argues that economic value varies due to the differing status hierarchy or 'data-class' (Manovich 2012, Andrejevic 2014) one occupies in a data-driven society. The lower class that produces data relinquishes control of personal data and faces status inequality where direct economic value is derived from their data by higher classes in the status hierarchy – those who can collect and analyse, making data extractable for its economic value. Taking a cue from this, the dimensions of recognition and redistribution can be employed to understand status subordination leading to and resulting from use of digital identity , and possible inequalities in cultural and economic domain formed due to impacts of identification and consequent datafication.

The third dimension seeks out fair political representation and equal voice in processes that define rules and make decisions within society. Injustice is the lack of political 'voice' in being able to participate in determination of the rules of the society that individuals ultimately live under. Fairness in procedural aspects, especially in relation to data, falls under this dimension, particularly relating to those which determine control of an individual's data. For instance, the tenet of 'information disclosure' has been considered the means to provide 'voice' to users to be heard by decision makers (Bier 1993). In the more recent datafied condition a 'fair' means of giving voice and control of one's data has been presented in relation to procedures of 'informed consent' and options for 'opt-in' or 'opt-out' (Ashworth & Free 2006, Fuchs 2011).

These three dimensions of participatory parity operate within the same politico-spatial 'frame', which is to say a typification of a societal setting not necessarily limited by geographical boundaries. The frame then defines the rules and in turn the boundary conditions of being accepted for participation, including in relation to a non-state or international entity. Any injustice in defining the boundary can exclude individuals from participation itself. In case of non-state participation like online services this can be understood as being defined by the 'terms and conditions' agreed. As the terms are dictated outside a 'normal' framework of justice there is potential for the frame to be set on 'exploitative terms of interaction [*which*] then exempt [*service providers*] from democratic control' (Fraser 2010). This complex political nature of justice particularly lends itself to study of surveillance and datafication run through private, non-state actors and also can help query the heavy involvement of private platforms and firms in technological infrastructures (Cinnamon 2017).

In summary, the conceptual framework (Figure 1) is used for analysis of the case study. The three aspects of 'abnormal justice' will in this view be used to query injustice in relation to digital identity. The dimensions will query: 'misrecognition' in the use of identity in seeking

to overcome cultural aspects of subordination, 'maldistribution' due to resulting datafication and its relation to enabling to unequal economic value creation, and 'misrepresentation' will deal with the loss of voice of individuals under surveillance mechanisms.

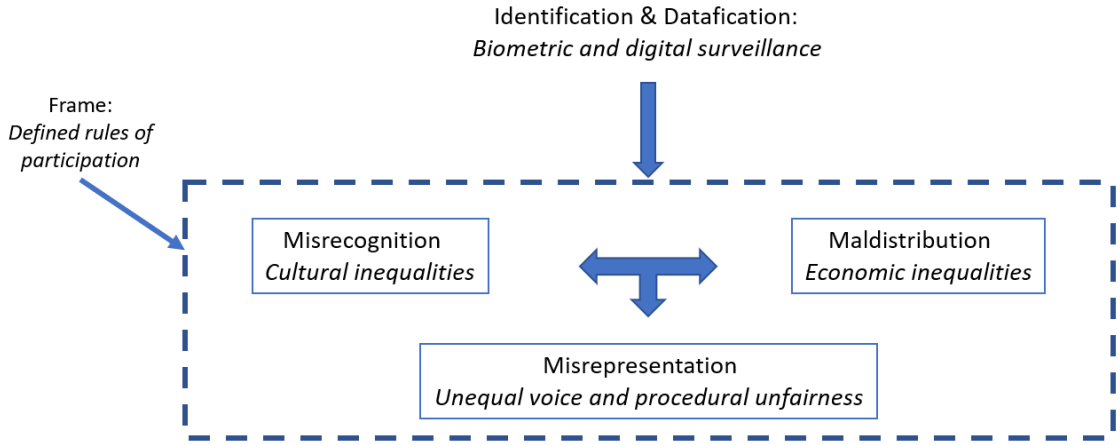

Figure 1: Data-Justice Framework – developed from Fraser (2000, 2008, 2009)

C. Case Background and Methods

Aadhaar, as undertaken by the Unique Identity Authority of India, works using biometric data – iris scans and fingerprints. These are linked to personal information like demographic data, address, mobile phone numbers and email addresses of citizens resulting in a random 12-digit digital unique identity number. Aadhaar then is used for a variety of services like opening bank accounts, receiving subsidies, or direct benefit transfer (Sarkar 2014, UIDAI 2014a, 2014b). Enrolment is 'non-mandatory' and is to be demand-driven (UIDAI 2014a). One of the key services enabled is 'Electronic Know Your Customer' (e-KYC). This offers electronic authentication and verification of individuals with its linkage to a bank account made mandatory for governmental subsidy, and mobile number linkage to Aadhaar made mandatory as the channel for communication of information by text messages in relation to subsidy by the state (MoF 2016). An 'open' architecture of digital infrastructure under Aadhaar was evangelised by proponents[1] furthering adoption of Aadhaar across public and private sector services as the basis for digitally driven financial inclusion. Based on this there has been growth of Aadhaar-enabled digital payment services including mobile applications and digital payment gateways, with the services developed, delivered and consumed by multiple private sector players.

Using Aadhaar, the state focuses on the financial inclusion of the informal sector which accounts for 81% of India's working population with most of this informality concentrated in rural and agricultural jobs (The Wire 2018). Given this focus a case study has been chosen with the city of Chennai (the capital of the South Indian state of Tamil Nadu) as the urban setting to explore the experiences of two sets of informal workers – cab-drivers and

[1] India Stack – a non-state collective of technologists whose expertise and knowledge exchange furthered adoption of Aadhaar across public and private sector services: http://indiastack.org/aadhaar/

domestic workers (CMDA 2008). The total working population in the Chennai Metropolitan Area (CMA) is estimated at 6.8 million in 2016 of which 1.2 million are deemed informal workers. In the state of Tamil Nadu – in which CMA is the largest urban area – urban in-migration has led to an increase in marginal settlements like slums and has driven the growth of urban informal labour in the last decade (TNGov 2014). Further, the choice to study domestic workers and cab-drivers was done due to their long-standing visible presence as traditional urban informal workers and the prominence of these jobs in the narratives of informality targeted by Aadhaar as a programme (UIDAI 2008).

An ecosystem of technologies (see Figure 2 below) provided by private sector companies and their eventual relation to Aadhaar are of interest for this case study.

- The first group of interest are the online recruitment portals that started catering specifically to 'blue-collar' workers in Indian cities. One of the earliest of the portals started in 2007 but with the bigger players joining after the advent of Aadhaar. These portals enabled job seekers to create online profiles detailing their skills and applying for jobs listed by potential employers as ads. Jobs listed include domestic workers, drivers, couriers and delivery personnel, 'handymen', restaurant workers etc. The focus of study here was of domestic workers who use these portals – e.g. Babajob, Quikr, Aasaanjobs – to seek employment.
- The second group of interest are mobile apps and platforms that cater to informal gig-based work specifically in urban areas. In recent years, these have grown with the advent of smartphones and location-based services. The focus here is on cab-drivers' use of ride-hailing apps which have supplemented and then fast replaced online recruitment portals as the source of employment opportunities. The drivers under study here use their own car, or leased cars via these apps, e.g. Ola, Uber.

In both recruitment portals and apps, the informal worker provides identity documents – in many cases a copy of Aadhaar as a paper document – to signal their legitimate identity as a potential worker.

Other than the above digital platforms there is the presence of digital trust platforms (e.g. BetterPlace, Yoti) which are used by recruitment portal and gig-work apps as a business-to-business service to 'verify' informal workers. This verification works by using their governmental identity information including photo and personal details cross-verified using digital scans against information provided by the informal workers on these digital platforms. With Aadhaar these work in two modes. First, online verification using Aadhaar e-KYC[2] where the UIDAI API with its open, vendor-neutral architecture (UIDAI n.d.), helps to confirm validity of personal information. Second, offline verification using XML data-files and QR code images encoding Aadhaar-related personal data. As part of informal worker onboarding these digital trust platforms use these e-KYC, XML or QR codes to do faster and bulk validation of information provided by the workers. The role of these digital trust platforms within the ecosystem has not been probed in detail, but it is acknowledged here as they provide a basis for the faster scaling up of digital identity use among informal worker populations.

[2] This has been limited after a recent Supreme Court ruling disallowing private sector use.

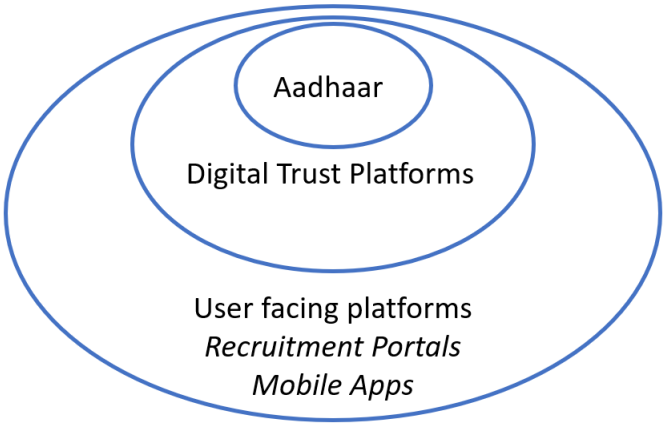

Figure 2: Ecosystem of Technologies

The case study is built by thematically analysing mainly interviews (see Table 1) using the data-justice framework described earlier (see Figure 1). Semi-structured interviews[3] of informal workers and worker group leaders were done between January to March 2019 focused on the daily-life experience of using technologies of Aadhaar and its ecosystem. Additionally, interviews of digital platform creators (management of a leading 'blue-collar' recruitment portal interviewed as part of a pilot in Bangalore during April 2017) were used to contextualise the data. Data was further triangulated by field observations and interactions, and by the author's use of digital platforms as a customer on ride-haling apps and by the author signing-up as a prospective employee on a recruitment portal. Secondary sources used included mass media content, government white papers and policy reports, technical blogs and documents, and websites of the platforms under study. All these are cited where appropriate.

Type (number of interviews/observation instances)	**Anonymised reference**
Domestic workers without online recruitment engagement (8)	DWA1 to DWA8
Domestic workers with online recruitment engagement (8)	DWB1 to DWB8
Domestic workers group and NGO leaders (3)	DWL1, DWN1, DWN2
Domestic workers self-help group (2)	DWM1, DWM2
Cab-drivers using ride-hailing apps (15)	CDA 1 to CDA15
Cab-drivers union leaders (2)	CDL1, CDL2
Digital platform creators – management-level employees from one of the leading blue-collar recruitment portals (2)	DPL1, DPL2
Cab-drivers union meetings (1)	CDM1
Cab-drivers protest (2)	CDP1, CDP2

Table 1: List of Interviews and Field Observations

[3] When this paper in the later parts refers to 'interviewees', this broadly means the informal workers interviewed, relating to a finding emerging across multiple interviews. Interviews of leaders and digital platform creators are specifically referenced where used.

D. Findings

This section is structured based on the data-justice framework discussed in earlier sections. The injustices arising due to cultural, economic and political subordination are presented respectively as per the 'abnormal justice' dimensions.

D1. Misrecognition

Asymmetry of Recognition

Aadhaar opens new avenues for informal workers to seek employment on digital platforms as cab-drivers and domestic workers. Prominently the slogan that the programme is branded with, is 'My Aadhaar. My Identity/Recognition'[4] . It is reinforced by government advertisement strategies that project use of Aadhaar as the digital means to claim recognition for disadvantaged groups – particularly domestic workers. The narratives with which Aadhaar has been presented thus plays on the need for recognition in gaining employment as an informal worker (Aadhaar UIDAI 2018). Before the Supreme Court ruling in late 2018 disallowed private sector use of Aadhaar, digital recruitment and trust platforms partnered with UIDAI in enabling e-KYC-based authentication of job seekers, showing the 'Aadhaar verified' tag on profiles as a signal of trust to recruiters, and to incentivise verification through Aadhaar for other job seekers (DPL1, ILO 2017). But clients – the private household employers on the recruitment portals and cab-riding customers on ride-hailing apps – who would employ the services of informal workers are not verified.

The digital verification here mainly works to signal trust by enabling the clients to gauge their risk in engaging services of a new employee. But a similar function is not available to the workers as the clients themselves are not verified digitally, resulting in an asymmetrical one-way formalisation of surveillance and recognition. Digital verification here replaces urban local-area informal referral networks which are traditionally used to seek employment (DWA8). There is a loss of these 'mutual trust' networks – sometimes in place for decades – which help informal workers recognise potential 'good' employers referred via word-of-mouth by their peers in both the cases of cab-drivers and domestic workers (DWL1, CDM1). Informal workers highlight this asymmetry as an issue of safety which hinders their easy recognition of potential employers and in not knowing their local work conditions, as the traditional peer networks provided a possibility to informally vet households of potential employers. Similarly, this asymmetry manifests again when cab-drivers highlight a need for assurance of their on the job safety. Citing recent crimes against cab-drivers by cab-riding customers (TOI 2017, HT 2018a, The Hindu 2019), the drivers suggest Aadhaar-based verification of cab-riding customers as a possible solution that mirrors their own verification on digital platforms (CDM1). Asymmetrical verification practices deem the informal workers only to be trusted after a formal mechanism of verification, even when they are provided no avenues for formal knowledge of their working conditions and employers.

[4] In Hindi – *Mera Aadhaar, mera pehchaan* – the word 'pehchaan' has a technical meaning of identity with recognition as the broader meaning.

Absence of Worker Legitimacy

The drivers argue that the stringent identity verification using Aadhaar while joining a digital platform – made mandatory for all practical purposes – uses their verification only to signal safety to cab-riding customers and enable participation in digital payment. Operationally the digital identity does not help them gain recognition as legitimate drivers during their daily work on the road due to lack of institutional support from the digital platforms, irrespective of the driver's verification status. This is especially evident when issues of customer dispute arise or when drivers need to engage with the police (CDL2). Traffic or beat police, as reported by cab-drivers, use their prior disposition of domination against informal workers. As a result, instances are reported where police use their petty power to verbally abuse and intimidate cab-drivers, and in some cases seek bribes (Thozhilalar Koodam 2019). Cab-drivers protest this as 'police harassment' and seek a means to gain legitimacy of their role as a driver (CDP1). Ultimately while a digital identity helps the drivers gain work through digital platforms it does not lend itself to signal legitimacy for such purposes on the road.

The fragmented nature of work on digital platforms is also related to how such issues of identity affect the cab-drivers. Consider the case of the long-running transport option of auto-rickshaws (also known in other countries as tuk-tuks) where an organised and formal unionising of drivers and collective efforts has long existed through 'auto stands' (local area parking spaces that act also as meeting spots) (Transparent Chennai 2012). In many cases these organised efforts also have the advantage of strong political party patronage. Auto-rickshaw drivers resort to their union or auto-stands for institutional support when for example they gain negative attention from the police in claiming their legitimacy as drivers. Cabs on the other hand are a recent phenomenon in Chennai, with a strong dependence on digital platforms as a basis for atomised self-employment. While digital platforms have reduced the infamous ability of drivers (both auto and cab) to set exorbitant rates and engage in undue haggling, the atomised existence of platform-based work leaves drivers – cab-drivers particularly – to their own devices to contend with the lack of recognition of their urban role as a driver. To get over this issue, fledgling efforts have begun on unionising. One cab-drivers' union now issues paper identity cards that they seek to use to signal their union membership. These collective efforts of the drivers are directed to claim their legitimacy given the lack of support on this front from the digital platforms, especially when stopped on the road by the police or when challenged by customers (CDM1, CDL1).

In summary, while Aadhaar provides increased employment opportunities, as a social impact the push for digital verification is seen to be based on the status subordination of informal workers, with their extant social subordination ostensibly extended into the digital realm. Here Aadhaar-based verification in its social role is directly used to assuage security anxieties of the clients of digital platforms who hail from middle and higher socio-economic classes. But as an identity Aadhaar and its uses on digital platforms is not set up to help claim legitimate recognition of the informal workers' role in their workplace and it does not address security and safety concerns of the informal workers. Ultimately Aadhaar works mainly as a tool of recognition asymmetrically through routine surveillance of the already culturally-subordinated groups – digitally reifying the socially extant inequity of recognition.

D2. Maldistribution

Limited Digital Financial Inclusion

Aadhaar is directly related to two aspects of financial inclusion of informal workers into the wider economy – as verification for bank accounts and to enable digital payments. The easy opening of bank accounts for previously unbanked populations like the informal workers has been the main agenda of Aadhaar in driving financial inclusion. The interviewees' expected benefits and reasons why they signed up to Aadhaar are tied to narratives of seeking economic betterment. These include the possibility to participate in the wider economy through the opening of bank accounts, and through the ease of accessing government subsidies and getting cash benefit transfers directly to their accounts. Specifically, they also mention the possibilities to access loans from both public and private lenders (various interviewees, DWL1, DWN2). These ideas presented by the workers themselves are congruent with the governmental narrative of Aadhaar-enabled financial inclusion.

While such Aadhaar uses have driven an increase in number of bank accounts, it is acknowledged widely[5] that in practice Aadhaar mainly acts as yet another paper document to prove individuals' identity, as was the case for most of the interviewed domestic workers. Such Aadhaar linkages are done mainly due to the state push to make these verified bank accounts a channel for receiving government subsidies. Digitally-enabled financial inclusion beyond this is limited as further formal economic participation using bank accounts does not occur easily. This echoes the World Bank finding (Demirgüç-Kunt et al. 2017) on financial inclusion where almost half of all accounts opened under the recent governmental efforts see them being inactive in the last year. This is true particularly for domestic workers whose wages are transacted in cash and their bank accounts only work to receive government subsidies. With the wider economy that the informal workers engage with being still cash-oriented, cash is still king for their livelihood (various interviewees).

In this context Aadhaar also enables digital financial transactions – like mobile payments or digital wallets based on linked bank accounts. But there is not yet a widespread use among the informal workers to undertake daily economic transactions using digital means, beyond that which is imposed by digital platforms as in the case of cab-drivers. Even the digital financial transactions integrated on ride-hailing apps present some challenges. Digital payments are clearly presented as a convenience and attraction to cab-riding customers to increase demand of platform usage. To match this customer demand, during the initial marketing phase, digital platforms ramped up the supply of cab-drivers and focused on enabling them to accept digital payments from customers. Drivers were incentivised to join with full verification using Aadhaar which was required for their use of digital payments. The initial promise was one of a lower commission taken by the digital platforms with the drivers promised higher income (CDL1). Drivers' experiences in Chennai echo reports from other Indian cities where drivers expected and were promised an income around Rs.100,000 per month (c.US$%1,500). But they saw their income fall to 20% of this promised amount. As

[5] Both from interviewees and from a report 'State of Aadhaar' from the Omidyar Network based on a large-scale survey for 2017-18 – see Abraham et al. (2018).

the market matured there was increased competition for passengers but also an increased share of income taken as commission by the digital platforms (HT 2018c).

Further specific tactics across the board from major ride-hailing apps cut into driver's income. In 2015 the platforms started levying a fixed fee per week from the drivers over and above the per-ride commission. This was designed as a bid to discourage drivers from switching between apps and to lock them in – as the fixed costs are payable even if the driver logs in just once a week. So, a driver using two apps will be charged by both platforms and is better off using only one of them to avoid double fixed costs. Such factors have brought about a decreasing share of cab-driver share of booking revenue (in one report a decrease from 60% to 24%) (ET 2018c). This lowering of income has also pushed some drivers into further financial difficulties, especially as some of the drivers purchase a car (and in some cases other items such as phones) via the platform financed through loans tied to their contract as a self-employed partner. Their income from the digital platforms then is deducted to the tune of the expected regular loan payment amounts, levied directly through the driver's bank account. All these factors lock such drivers to the platform for employment with declining earnings with them stuck with the major ongoing liability of a car loan with additional payment processing fees payable to digital payment providers which cut into the cab-driver's profit margin.

Impacts of Digital Payment

The adoption of Aadhaar is related to the increase in digital payments within the last few years which specifically has impacted informal workers. The Indian government, driven by Aadhaar as a core technology has pushed for a 'state-of-the-art' digital payment system (RBI 2019a). Digital identification plays the central role in the long-term strategy of the India central bank to ensure availability of 'aggregate data' about credit across the country and to drive formal economic participation (RBI 2019b). The culmination of these efforts was the demonetisation of currency notes that happened in 2016, which disproportionately affected those within the informal sector (Gupta & Auerswald 2019). Nearly 80% of currency in use in the economy was taken out of circulation by the Government of India – citing control of corruption and 'black money', and as a bid to force formalisation of financial transactions within the sizable informal part of the Indian economy. Informal workers saw the immediate necessity to participate in the digital economy for their livelihoods and encountered rapid changes in employment and their income governed by the digital platforms. The cash crunch not only affected the livelihoods of cash-dependent informal workers, but also the informal part of the economy that they depend on, due to the inability of small businesses like micro traders who struggled to adapt to digital payments (Unni 2018).

Meanwhile, there has been an acceleration in the Indian economy with cashless and digital transaction becoming prevalent bringing in a near-exponential increase in the digital payments market. Cab-drivers are increasingly dependent on the digital platform's integrated payment solutions such as digital wallets or card payment interfaces. Though these solutions have been reported to have frequent operational delays in transferring customer fare payments into the bank accounts of the cab-drivers (various interviewees). Even as the Indian government pushed for the spread of digital payments and reduced the transaction costs of taking card payments – which were at 1 to 2% – the digital platforms

have not passed on this reduction in costs to the driver. Due to these factors lowering their income, drivers sometimes see a situation of daily cash crunch. Most of them depend on the turnover of cash to manage their mostly cash-based daily living and working conditions including paying for petrol (CDL1, CDL2, various interviewees). To counter this effect of digital payments it has been observed that some drivers call potential riders, after accepting rides and ahead of pick-up, to agree on cash payments (CDL1, author observation). Though not all can undertake this workaround due to platform-imposed revenue targets.

Thus, the imposition of digital payments affects informal workers disproportionately compared to upper and middle socio-economic classes who have access to formal and regulated banking. This, as an increased benefit to the already formalised section of the economy, reinforces existing economic inequality driven by increasing dependence on digital payments. With the digital platforms and the gig-economy remaining largely unregulated, the workers face exploitative terms of work and uncertainties even when they do participate in digital payment transactions.

Monetisation of Data

At its core, digital verification is presented as a direct economic benefit to informal workers with them handing over their personal data and sometimes engaging with biometric surveillance in the process. This results in a direct loss of control of their personal data in the absence of actual legal data protection and defined privacy assurance on digital platforms. The platforms derive economic value through monetisation of this data which is available without any legitimate guidelines of data-use. An analysis of recruitment portals show that monetisation is sought by sale of premium services and subscriptions to both recruiters and job seekers alike. The recruiters are able to ‘buy’ contact information in tranches which includes personal information of the job-seeker. Additionally, data-driven marketing elements like advertisement revenue and cross-selling using data-analytics are made possible. The observed case was of ‘special offers’ for jobs seekers seemingly targeting ‘verified’ job-seekers using their profile data which advertised opening a bank account using ‘easy’ identity verification.

The accumulated data due to increasing datafication and new-found digital participation of informal workers is available to the platforms as a user-base and dataset which in turn forms an economic asset that makes up a core part of their business model (DPL1, DPL2). This is seen in the growing economic performance of the platforms – with ride-hailing app valuations driven by verified driver numbers (Traxcn 2016), and an ongoing consolidation in the recruitment portal market based on their ‘blue-collar’ worker user-base (Modgil 2017) . The state has also bolstered increasing datafication by policies like the National Career Service (NCS) government portal which makes Aadhaar mandatory (NCS n.d.) for registration for job search. The government portal includes listing of urban informal worker opportunities and works with direct integration to online recruitment portals and ride-hailing apps.

Thus, Aadhaar-enabled verification of the previously digitally excluded population driven by existing economic inequality is the basis on which these business models see a direct increase in their user-base enabling extraction of economic value of user data through the

monetisation practices on these platforms. This echoes arguments of 'informational capitalism' (Andrejevic 2015) – of parting with one's personal data not necessarily providing economic value to the individual but extracted for value in the aggregate by platforms. The main issue of equity arises due to the synergy of technology companies' business models and the state push for ostensible mandatory digital securitisation of society under Aadhaar. While the workers find new avenues for job-seeking via the digital technologies, enabling digital participation in this mode without due protection has helped platforms gain the most economic value with clients following next in gaining advantage due to digital provision of services. The state to a lesser extent gains the ability to enact digital surveillant control on the previously invisible informal workers. Ultimately informal workers themselves gain the least in such an environment where the absence of regulation and data protection directly places them in an emerging form of economic subordination.

D3. Misrepresentation

Informed Consent Issues

Aadhaar's procedures for 'informed consent' have been contested legally and in practice. This is especially because the law that ratified Aadhaar and its defined process of consent emerged in 2016 but biometric and other data had been collected since 2010 (ET 2018d). Mass collection of consent was done in what has been referred to as 'consent camps' (ET 2017) with a rather bureaucratic approach to getting consent by rote 'retroactively' after the wider roll-out. Echoing this the interviewed informal workers acknowledge routine signing and filling up of forms during enrolment and linkages; undertaken without time or capacity to fully understand what is being signed. Moreover, many of the online forms and printed terms which collect consent are in English, the dominant language of governance in India (author observation). This is true of commercial digital platforms as well. Yet English-language literacy among informal workers is low. These issues position the surveilled individuals facing a lack of information while giving consent, particularly so for informal workers who are disadvantaged in data-literacy and language (Kaur 2018); a systemic issue faced by marginalised groups. As one of the domestic workers puts it linkages are done as 'the government says so and we do it. We don't question it' (DWA7).

This has enabled seemingly 'mandatory' Aadhaar linkages pushed by private players like telecom companies. With the absence of clarity on whether Aadhaar was mandatory or voluntary, during the early months of 2018 banks and telecom companies sent continuous and officious notifications forcing customers to link Aadhaar to their bank accounts and mobile numbers (Manzar 2018). This practice continued until a clear direction on the disallowance of private use of Aadhaar authentication came in by September 2018. The 12-digit Aadhaar numbers collected by such mechanisms still reside in the databases of the private sector agencies (HT 2018b). This and the pervasive linkages of Aadhaar numbers to multiple databases presents a possibility for cross profiling by the state and private entities; again without the explicit or valid informed consent of the individuals who have been recorded.

Disparity in Procedural Redressal

Following the Supreme Court ruling in late 2018, the sharing of Aadhaar numbers and linkages to certain private sector services like telecom companies or mobile digital payment providers was deemed a security issue that needed to be addressed. In response, specific solutions were devised including Aadhaar de-linkage requests (Business Standard 2018) using online forms or emails directed to private sector providers, and a solution of a temporary 'Virtual Identity Number' generated online that would mask the actual Aadhaar number (ET 2018b, IE 2018). The identified issues of security were independent of the kind of users of Aadhaar and cut across all different classes of the society. However, since the redressal presented for these issues was mainly depended on online solutions and use of the internet. These solutions thus have an unequal reach putting vulnerable groups like informal workers at a disadvantage.

In fact, there has been a dearth of promotion and wide communication of the solutions to security issues, compared to how strongly and in an accessible manner the linkages were pushed in the first place using mobile text alerts. This too affects the vulnerable population disproportionately. Interviewees mentioned that while some aspects of the Supreme Court ruling and the media conversation around that are known to them, none of them have used a Virtual Identity Number or sought de-linking as they have not been informed authoritatively by telecom companies or the state about these things. Even the cab-drivers who are more data-literate relative to the domestic workers group, mention that while they use mobiles apps and services like Facebook (CDL1), the engagement with online governmental processes is limited and time consuming.

The inequity of these redressal processes being primarily online or smartphone-based is compounded by two other factors – kiosk-driven services and mobile-based 'one-time-passwords' (OTPs) for security. Firstly, government Aadhaar kiosks are expected to serve those who cannot access the internet directly. This creates a disparity for the marginalised groups who need to pay to access kiosk services as opposed to someone who can access these free services on the internet. Further, due to delays or higher demand at regulated governmental kiosks, the informal workers recount being forced to use unregulated and potentially corrupt private internet browsing centres which charge higher fees that are hard for these workers to afford.

Secondly, the safety of Aadhaar transactions is dependent mainly on a 'secret' mobile text-based OTPs (LiveMint 2018). These OTPs are routinely shared with others – especially due to absence of clear information about their usage and because of data-literacy challenges as experienced by informal workers, which directly affects their data security. Domestic workers – almost all of whom using feature phones rather than smartphones – reported it difficult to engage with the OTP process. They depend on an intermediary such as a family member or acquaintance to read text messages, with many such alerts reported by some as having been left unread for a long period of time. In one case it resulted in delay of subsidy reaching the domestic worker's bank account (DWL1). Further, In case of cab-drivers they report submitting Aadhaar paper copies at the time of signing up to be a ride-hailing app driver and receiving multiple OTPs on their mobile which were then asked for by customer care agents over the phone (CDL1, CDL2). These were effectively used to set up the cab-

drivers with digital payment options related to the apps. The cab-drivers in their subordinated position find it obligatory to share the OTPs and without any opportunity for provision of informed consent. Loopholes like this have been highlighted as the basis for financial scams where impostors pretending to be officials call up asking for Aadhaar-related OTPs (Ganjoo 2018).

Thus, procedural aspects around Aadhaar present a subordination based on digital access and data-literacy to create undue disparity based on both information presented and of recourse to redressal. Marginalised communities under Aadhaar who are pushed to mandatorily use digital identity are unable to voice consent in practice due to an ineffectiveness or absence of information presented to them. This is further exacerbated when procedural solutions as corrective action also create disparity due to varying levels of digital access.

E. Discussion

Under abnormal justice Nancy Fraser presents a 'frame' as the rules of participation across the three dimensions of justice. Here the 'frame' is the basic societal rules of Aadhaar-led inclusive participation of informal workers driven by data and identity. This in practice is a heterogeneous assemblage of laws, processes and technologies, which have been queried in the above discussion. Taken as a whole the understanding of the 'what' of justice emerges – as equitable participation overcoming subordination in attaining fair recognition, distribution and representation. This also presents a means to connect justice to the wider context of marginalisation, digital identification and the datafication of livelihood at large. This alongside a further discussion on the data-justice framework follows in this section.

E1. Justice under Datafication

Culturally, justice can be formulated as fair access to legitimacy, as sought by marginalised groups in their use of digital technology in a bid to overcome the existing social imbalance of recognition that acts against them. Additionally, data justice also needs to incorporate the impact of participation in the digital economy. Justice then can be queried; asking if technology helps overcome cultural subordination or in a negative sense technology acts exploitatively to cement existing inequities. Much as Cummings & O'Neil (2015) commented, here technology is a 'mirror' of the society, in that it can replicate the extant class-based and cultural issues related to marginalisation. Going by the case evidence, data justice has to account for the risk that subordination – which existed in cultural and social practices experienced by marginalised groups – is digitally reified onto their datafied representation and the technological processes they engage with.

Economically, digital identity is intimately connected to economic development and poverty reduction programmes as evident in agendas such as 'identity for development' (ID4D 2016, Beduschi et al. 2017). But these programmes do not account for the impact of datafication that inevitably follows the provision of digital identity. Data in such a case has been seen to be intrinsically connected to economic value production for commercial players. Clearly,

enough evidence exists that imperfect protection of an already marginalised community can further exacerbate their economic condition. But an additional distributive aspect of justice then emerges where technology helping fair participation of the economically subordinated can also enable unfair exploitation of the personal data of the marginalised. Injustice here as shown can lead to even further economic subordination based on the newfound digital participation of marginalised groups.

Finally, in the political domain, justice as an aspect of representation is intimately connected to the wider political voice-lessness of marginalised groups – the solution to which is devised through digital technologies and by datafication by recent governmental policies and programmes (Gurumurthy et al. 2016). Digital identity is clearly adopted globally under such a tenet. Two aspects of datafication form the focus of political justice. Unjust rules for consent under processes of datafication deny vulnerable communities a voice in participating equitably, putting them at further disadvantage. Redressal efforts to technological problems also can be procedurally unfair, aggravating existing marginalisation. Justice then is conceptualised as equal 'voice' through informed consent and as a fair procedural means to question any vulnerability arising due to digital technology.

E2. Stakeholders of Data Justice

The case study also provides insights into subordination through the 'who' of justice – the second node. As Fraser (2009) noted, cultural and economic subordination can feed off one another – with middle and higher socio-economic groups who already enjoy dominance reifying that position in the digital realm. People can be understood as disparate classes within society with digital technology clearly benefitting some over others. This presents an opportunity to theorise the role of those who are affected by technology and data under the data-justice lens. Existing discussion of inequalities related to data (Manovich 2012, Andrejevic 2014, Cinnamon 2017) presents the analytical category of users related to datafication based on personal data production. For instance, Manovich (2012) presents three divisions of the 'data-classes' – the ones who create data, who collect data, and who analyse data. But the 'who' of data justice based on the above discussion can extend analytical categories beyond data production. Especially to contextualise the impact of data after its production and use, one can propose a data-class based analysis of stakeholders to study effects of datafication and who it benefits. This will invoke the three dimensional cultural, economic or political subordination in categorising stakeholders. From the case study, we can ascertain that Aadhaar as a means of digital participation unjustly subordinates informal workers in relation to other entities:

- Culturally, informal workers continue to be subordinated to clients who engage services using digital platforms. These are the private household employers on the recruitment portals and cab-riding customers on apps. Additionally, the state through the actions of the police continues to exert local power on informal workers.
- Economically, data is accumulated by digital platforms for extraction of economic value, presenting an unjust distribution of economic value that is based on the newfound and unprotected datafied existence of informal workers.
- Politically, the state and private entities create disparities based on informed consent and recourse to procedural solutions that create further digital-led vulnerability for informal workers.

F. Conclusions and Recommendations

The intricate entwinement of surveillance and datafication under digital identity has been explored in this paper with a case study of Aadhaar, India's biometric digital identity programme. The paper makes specific contributions in theorisation and through presentation of empirical analysis. The paper presents an adaptation of the social justice theorisation that works synergistically with notions of surveillance and datafication to present a data-justice framework. Using a rich empirical analysis, the paper has demonstrated the viability of such a framework derived from Nancy Fraser's (2009) work on 'abnormal justice' and its constituent dimensions – cultural recognition, economic distribution and political representation.

Empirically, by analysing the emerging surveillant technology of Aadhaar and its networked ecosystem, the paper sheds light on the social impact of such a programme. While surveillance using a digital identity is aimed at an agenda of inclusive participation of the disadvantaged in society, the use of a social justice lens points to the complex nature of its impacts. Via study of cab-drivers and domestic workers and their use of digital identity and platforms, this paper engages with digital identity and its complex networked ecosystem to understand consequent datafication, data-flows and their impacts.

Digital identities, it is found, do produce benefits to marginalised communities like informal workers in providing a legal identity both digitally and on paper – as a means of recognition, and in helping them participate in the mainstream economy through subsidy disbursement and by providing access to formal bank accounts. But there are downsides to these benefits across the three domains of justice. It is found that digital identity in its current form largely prioritises cultural and economic benefits for middle and higher socio-economic classes. Culturally, lower socio-economic classes do not see an improvement in their social standing as claimed by the wider identity agenda, while also being affected in the economic domain due to personal data being prone to extraction for value by commercial digital platforms. This is further impacted politically by inequity in voicing needs and due to unfair procedural aspects, both of which inordinately affect lower socio-economic classes.

These findings point to an exacerbation rather than narrowing of inherent inequalities between marginalised communities like informal workers and the more formal entities of Indian society: commercial businesses including digital platforms, and their middle-class clientele. Particularly it presents a complex synergy between governmental and private sectors: the data-flows between them and the impact on an already vulnerable population. Thus, the implication of the findings would be on both domains of data-subject rights and citizen rights. Although the discussion in the paper is based on the Indian case study, by engaging with the contestations for justice under surveillance and datafication, this paper has sought to more-widely contextualise the experience of marginalised communities under datafication. The paper also proposes understanding data-justice stakeholders using an extended 'data-class' notion incorporating the complex nature of cultural, economic and political interactions enabled by data.

The findings and the theorisation presented here contribute to the research agenda by addressing a specific knowledge gap. The social justice approach used here specifically

answers the call to move away from the top-down technological approach prominently taken in presenting digital solutions that seek to enhance equitable participation in society (Eubanks 2014). In light of this, the paper has sought to understand everyday routines through which individuals use technology and data, and engage with digitally-delivered participation and its resultant social impacts. This argument has found favour with authors writing on data justice (Taylor 2017, Heeks & Renken 2018). Thus, the theorisation presented subsumes aspects of marginalisation, inequality, datafication and surveillance all under a lens of justice. Building further on this the research also seeks to understand the wider impact of data and technology in the global South in a way that goes beyond the individualistic-centric paradigms of privacy and rights which have been acknowledged as a gap in research (Marwick 2018).

Building on this paper, a future research area that needs closer inspection would be the effects of ongoing platformisation of work and wider datafication on informal workers. This paper particularly has laid the groundwork to understand the global South context in two specific ways which need to be prioritised for future research, especially using the lens of social justice. First, this paper has briefly explored the ways in which digital technologies like identity and gig-work platforms are intricately connected to collective and individual rights of informal workers in a datafied employment landscape. A detailed study of this is warranted with focus on the role of formal labour unions and other informal entities, and their efforts such as protests, collective bargaining and membership drives. Second, this paper has discussed specific details of how daily practices of informal workers are affected due to newfound digital participation on platforms. A wider exploration of the existing informality and marginality of such global South workers is needed, with a possible longitudinal study of informal workers transitioning into gig work. This can shed light on the expectation and needs of marginalised users such as informal workers before they transition onto digital platforms and provide insights into the impact, both positive and negative, once they take up gig work.

Finally, the following recommendations for practice can be garnered from the analysis of this paper:

- There is a need to determine the boundaries of datafication – with particular focus on limits of open-architecture systems.
- Promoting advocacy of data rights among vulnerable populations is needed alongside data-literacy improvements.
- Transparency needs to be demanded from governmental data-sharing arrangements especially in the global South.
- Mechanisms of accountability for monetisation of personal data from governmental and private players alike need to be established including its impact on vulnerable populations.
- Advocacy is needed for hybrid-artefact solutions like smart cards, that can work stand-alone or when connected, and that can enable digital participation of vulnerable populations while mitigating risks of open architecture and multi-purpose digital identity.

These serve to engage with the rampant datafication in the global South in the absence of a data-protection law – an issue in a number of countries, including the case of India under study.

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