Datafication, Surveillance and Inclusion: A critical analysis of digital platforms and their role in India.

Student name: Shyam Krishna Raja Gopalan
Student number: 100804639

School of Business and Management
Royal Holloway, University of London

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Declaration of Authorship

I, Shyam Krishna Raja Gopalan hereby declare that this thesis and the work presented in it is entirely my own.

Where I have consulted the work of others, this is always clearly stated

Signed: __Shyam Krishna Raja Gopalan____ Date: _____17/12/2021_____

Dedicated to…

My Amma and Appa.

Miss you.

You would have been proud of me.

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ABSTRACT

Inclusion within information systems and ICT4D research is primarily invoked as a positive benefit on the human actors involved. Set in this context, this thesis conceptualises inclusion under the growing presence of digital platforms as complex newfound participation afforded to socioeconomically marginalised individuals.

The thesis employs two overlapping theoretical lenses of 'liquid surveillance' (Bauman & Lyon 2013) and 'abnormal justice' (Fraser 2008). Firstly, the metaphor of liquidity in this thesis deconstructs surveillance as a mesh of multiple visibilities within digital platforms. Secondly, a social justice framing positions the impact of the surveillant visibilies on marginalised individuals as an intersectional outcome of inclusion performed across cultural, economic and political dimensions.

The empirical context involves studying India's governmentally mandated digital identity platform (Aadhaar), situated within the constellation of digital 'gig-work' platforms that are becoming prevalent sites of employment. The data presented forms a qualitative case study of the experience of three groups of gig-workers, namely domestic workers, cab-drivers and food-delivery workers, forming a total of 60 interviews. This is supported by ethnographic field observations and auto-ethnographic research, working as gig-worker in south India.

The thesis is in an 'alternative format' with three constituent papers presenting interrelated perspectives of digital platforms and their wider ecosystem. The first paper studies the use of Aadhaar by domestic workers and cab-drivers (Krishna 2021) and operationalises 'abnormal justice' as a framework to theorise cultural, economic and political dimensions of justice as being synergistic with elements of surveillance and datafication inherent to digital identification. The second paper details the practices of datafication and surveillance within the food-delivery platform (Krishna 2020). It finds that in the performance of gig-work, (in)justice is experienced spatiotemporally by workers within their daily work practices. The third paper (Krishna n.d.) uses a lens of 'liquid surveillance' to conceptualise the concomitant roles of platforms in enacting surveillance and enabling inclusion. Within platform ecosystems, a 'liquid inclusion' is exposed to be dictated by episodic tasks of self-surveillance rather than being an absolute positive benefit of participating in the digital economy.

The thesis bridges a gap in literature within information systems and ICT4D by juxtaposing surveillance and inclusion. It adds to the emerging literature on 'data justice' in operationalising justice under platform ecosystems and specific practices of gig-work environments.

Research Papers

There are two published papers within this thesis, with the third paper being finalised for submission.

Krishna, S. (2020). Spatiotemporal (In) justice in Digital Platforms: An Analysis of Food-Delivery Platforms in South India. *Proceedings of IFIP Joint Working Conference on the Future of Digital Work: The Challenge of Inequality (pp. 132-147). Springer, Cham*. https://link.springer.com/chapter/10.1007/978-3-030-64697-4_11

Krishna, S. (2021). Digital identity, datafication and social justice: understanding Aadhaar use among informal workers in south India*. Information Technology for Development, 27*(1), 67-90. https://www.tandfonline.com/doi/full/10.1080/02681102.2020.1818544

Krishna, S. (n.d.). Liquid Inclusion: The dynamics of inclusion under datafication and surveillance. *In Preparation.*

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1. INTRODUCTION

This chapter provides an outline of this thesis, beginning with the motivation and rationale for the research. Then a brief background is presented of the empirical setting, followed by a discussion of research questions. This thesis adopts an alternative format of three constituent papers. This chapter ends with an overview of the specific contexts of the papers and how they connect together.

1.1. Motivation and Rationale

This thesis is set within and traces the impact of a phenomenal growth in digital platforms in India. There has been a wide and deep digital transformation of India's governmental and commercial services in the last decade and a half. This thesis looks at how this advent of digital platforms impacts those who find themselves inducted into a digitally mediated economy for the first time, particularly those groups who are already socio-economically marginalised. Within this, the thesis presents the experiences of informal workers entering the digital economy for the first time under surveillance and datafication practices of digital platforms.

The most noticeable digital platform, which has perhaps had the most significant impact on marginalised groups in India, is that of Aadhaar –the national biometric and digital identity system. Aadhaar - meaning 'foundation' – is a program to assign a 12 digit 'unique identity' project to all India's residents. Aadhaar, proposed in 2009 and implemented by the Unique Identification Authority of India (UIDAI), works to 'guarantee identity' of those who enrol in the program. The universal coverage of Aadhaar positions it as a mandatory 'single channel' for existing and newer public sector service, welfare and benefits programmes (UIDAI 2012). Employing this universal coverage, Aadhaar in 2018 had reached more than 1.2 billion of the Indian population, including an estimated 500 million below the poverty line.

The main aim of Aadhaar is to achieve financial inclusion by serving as unique, biometric, mobile and digitally verifiable proof of identity for individuals to establish trust during their online and offline interactions. Both government and private technology sector proponents of Aadhaar positioned digital identity as a reliable way to bring the large working population of informal workers into the mainstream economy (Nilekani & Shah 2016). As the consequent adoption of Aadhaar increased with millions of Indians enrolling into the system, the context of its application shifted from being the identity for government services to many commercial services opting to use it as a 'proof of identity'.

Another sweeping change effected by digital platforms and connected to Aadhar was how informal workers both sought employment and performed their labour. Online recruitment portals targeting 'blue-collar' informal workers first adopted the use of Aadhaar as a part of a background verification for employment. This then extended to the fast emerging 'gig-work' digital platforms. Gig-work is time-limited and task-based employment usually mediated by digital smartphone apps that match a 'gig-worker' with the customers requiring a specific service. Erstwhile informal workers, initially cab-drivers, found work on these platforms. Aadhaar became a primary route of entry into gig-work as it was needed as documentary proof by the platform and banks. Then Aadhaar was linked to personal income tax numbers for all workers, and it was made necessary for any digital payment systems. All of this entwined Aadhaar with informal workers' experience, from recruitment to their daily performance of work.

1.2.Juxtaposing Surveillance and Inclusion

This research is motivated by the contemporaneous development trajectories of Aadhaar as a governmental digital identity platform and gig-work platforms as a commercial source of employment and the multiple points where these two intersect. Both Aadhaar and gig-work platforms have become a valid route to 'inclusion' for informal workers. Gig-work has become a viable mode of employment in India over the last decade, with both cab-hailing and food-delivery services becoming the most commonly used gig-work platforms (FE 2019). Both these types of platforms have a near duopoly in 2021, with Uber and Ola Cabs being the biggest platforms for cab-hailing and Swiggy and Zomato for food-delivery. What was seen was an intricate meshing of commercial and governmental platform technologies, which signalled an escalating complexity of the wider digital platform 'ecosystem'. This effacing of the private and public sector divide led to obvious governmental surveillance concerns and commercial data exploitation. Equally, researchers and labour rights activists raised issues within gig-work platforms about how the digital mediation of work and livelihoods affected workers.

The state, unsurprisingly, preferred to distance itself from any idea of surveillance, inevitably embroiled in the narrative of Aadhaar's biometric technologies and its data collection. Rejecting outright the concerns about surveillance, Nandan Nilekani, the then head of UIDAI, rationalised the use of Aadhaar as a tool of inclusion to bring the informal sector into a digitally-driven formal fold:

> [Aadhaar is] really a huge project of social inclusion. It's about giving people a chance to be part of the formal society, or the formal economy. (Nilekani 2013, pg. 2)

> [Aadhaar] just gives you an ID and verifies your ID. So, the ID database does not collect all kinds of data about you. It really collects only very basic information, such as your name, your address, your date of birth, your sex, and your biometrics… So, everybody keeps their own parts of the data; there is no "Big Brother" here. It's not about massive data collection. It's just a simple ID system… (Nilekani 2013, pg. 10)

Nilekani elsewhere in the same speech contradicts this idea of a benevolent identity system by centring the surveillance capabilities of digital platforms when discussing Aadhaar as a way to 'leapfrog' millions into inclusion. He said :

> …whatever we're doing today could not have been done five years ago. It has been made possible because computing power and software have become more powerful and because one can set up databases for a billion people, which has been shown to us by the Internet companies that have a billion users. (Nilekani 2013, pg. 3)

The above example shows the inherent paradoxical role digital platforms play, which begins with Aadhaar's underlying technical architecture principles. Aadhaar's architecture was built on Big Data principles of 'openness' to achieve maximum interoperability with other forms of networked technology and 'scalability' to achieve high volumes of data and transactions (Varma 2014). The hope of Aadhaar being a route to financial inclusion was matched by the expectation that it will be a data-driven and consumer marketing tool. Aadhaar was expected to create opportunities for a 'more open marketplace' where marginalised populations could overcome their 'anonymity' to participate effectively as consumers. (MoneyLife 2010). In short, Aadhaar as a digital identity program was mired in surveillance and inclusion being co-positioned even if implicitly so.

The digital transformation in Indian society that began with Aadhaar, saw other key events and programs adding to a complex landscape. In this marginalised workers of the informal sector have been a clear target audience with gig-work platforms being the logical inheritor of all these impacts. A significant event that primarily affected informal workers and had wider economic impact was the demonetisation announced by the Union government in 2016 (Gupta & Auerswald 2019). Demonetisation meant that nearly 80% of cash in circulation was taken out of use by the Indian government, citing control of corruption and 'black money'. Economic analysts considered demonetisation as having shocked the informal economy into a formalisation of its financial transactions, mainly with digital payments enabled by Aadhaar (RBI 2019a). In more recent times, the government has centred gig-work as a route to formalising the 'blue-collar workforce' (ET 2021). Here,

an Aadhaar based registration of gig-workers and other informal workers is mandated into a governmental portal, resulting in a National Database of Unorganized Workers (NDUW) (Eshram n.d.).

Additionally, in the next decade, nearly 90 million new gig-workers are expected to emerge in the Indian economy, with many of them transitioning into digital platform ecosystems largely from informal sectors (BCG 2021). This ecosystem at its core is made of the overlapping networks of governmental and private sector digital platforms of Aadhaar and gig-work with broader connection to banking, digital payments, and other downstream digital commercial activities these platforms influence. The erstwhile informal workers then are scrutinised by a network of multiple surveillance mechanisms, performed by government, private, biometric and digital means. A central concern here is the discriminatory potential this surveillance will have on the already socio-economically marginalised workers. This digital participation at the same time is expected to afford them access to potential financial inclusion through digital payments and formal banking.

Fundamentally, Aadhaar's basis for inclusion springs from its function of casting individuals as data. Aadhaar's public and private sector proponents believe being cast into data will free marginalised individuals from larger socio-cultural markers and drive social inclusion. Aadhaar is depoliticised as a 'random number generated devoid of any classification based on caste, creed, religion and geography' (UIDAI n.d., About Aadhaar page)[1]. This thesis picks up on such uncritical techno-optimistic stances as a signal to explore the complex economic and other socio-cultural impacts on the marginalised individual cast as data. For instance, it has been acknowledged that even when the state shapes and improves the technical security aspects of Aadhaar, its benefits do not always apply to the marginalised population, leaving them more vulnerable to a misuse of their personal data (ET 2018). Additionally, marginalised individuals will face a steeper barrier in reaching intended inclusive outcomes from platforms like Aadhaar due to structural factors like data-literacy, absence of awareness, or lack of access to redressal mechanisms to data theft (Abraham et al. 2017). Particularly for informal workers, data then is intimately involved with their participation in the digital economy, in performing labour and seeking a livelihood within a complex platform ecosystem.

1.3. A Question of Datafication

Ultimately, informal workers navigate the negative impact of commercial and governmental surveillance tactics within digital platform context, which also defines a pathway to inclusion into the wider economy as a potential positive benefit. This study centres on this seemingly paradoxical nature

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[1] See 'About Aadhaar' page at UIDAI's website
https://uidai.gov.in/index.php?option=com_content&view=article&id=14

of workers' participation in the digital platform ecosystem by framing surveillance and inclusion as entwined. At the point of their intersection is the idea of 'datafication'. Datafication is a process rooted in the 'Big Data' paradigm, which is presented as the transformation of social actions or outcomes into data through online quantification (Mayer-Schoenberger & Cukier 2013, Van Dijck 2014). This datafication that co-positions surveillance mechanisms and pathways to inclusion is under question here.

This thesis casts Aadhaar's core function as datafication, allowing personal data to move within the platform ecosystem. This framing contrasts the mere beneficial provision of identity as claimed by the state. The effect of datafication then on marginalised workers are profound compared to the rest of the population. As datafication follows through as an inevitable process of seeking an identity and is involved in performing gig-work, it is intimately connected to surveillance and inclusion. For the workers, Aadhaar's data impinges into the contexts of gig-work and does not work only as a proof of identity. Using the digital identity for seeking employment and registering for digital payments, data validated by Aadhaar defines the workers' position within the wider platforms ecosystem.

The construct of datafication, in this thesis, then brings in ways to study practices where there is a melding of private and public contexts with a collection of large quantities of data, its analysis using predictive and algorithmic mechanisms, and the extraction of a largely economic value from these datasets. There are clear calls within academia to position these practices of surveillance and datafication to break the notion of platforms being unidimensionally considered beneficial or even being cast as neutral towards the general public (Flyverbom & Murray 2018). The extractive use of data is also positioned as a capitalist function of digital platforms in conducting wider and deep surveillance (Zuboff 2015, Sadowski 2019). So individuals under platforms' surveillance practices are cast gradually as commercially oriented 'data-subjects' more than as citizens, even when the interaction is within a governmental context (Taylor & Broeders 2015).

1.4. Research Contributions

At this point, the interest for this thesis is not only the contrast between aims of surveillance and inclusion but also how digital technology is positioned differentially between the global North and the global South. This thesis is set within a body of research traversing disciplines of information systems (IS) and information communications technology for development (ICT4D) and cognate fields such as critical data studies, surveillance studies, development studies, and human studies geography. Research in these disciplines has shown a growing interest in digital platforms' social impact, particularly within the global South. Further, many researchers also acknowledge that the study of platforms as sites of commercially minded surveillance and datafication is restricted mainly to contexts

of the global North. Particularly in ICT4D research, the potential negative impact on marginalised communities does not balance digital technologies as a path to inclusive benefits. Scholars have criticised this techno-optimistic view calling for research engagement with surveillance risk within the global South, particularly acknowledging the 'dark' side of digital technologies (Zheng et al. 2018, Chipidza & Leidner 2019). Further, as Arora (2016) presents, there is an over-emphasising the risk of surveillance in the global North while the same technological footprint is seen in a techno-optimistic light in the South.

For the studies of digital platforms specifically, a gap in IS and ICT4D research has surfaced clearly, with a need to examine *in situ* global South contexts (De Reuver et al. 2018, Koskinen et al. 2019, Heeks 2020, Bonina et al. 2021). Despite platform technologies commonly being seen as the default route to development within global South economies, as Heeks (2020) presents, there is limited engagement with how the logics of such 'development platforms' play out in practice. Very relevantly to this thesis, the disconnect in how digital technology is viewed across the global North and the South is perhaps the most visible in how digital identity and gig-work platforms are presented in the literature (and as reviewed in the next chapter). Across gig-work and digital identity research, there are growing calls to contextualise global South peculiarities (Heeks et al. 2021, Masiero & Arvidsson 2021, Bonina et al 2021). For instance, platforms like Uber for ride-hailing and Deliveroo for food-delivery attract a defined framing of surveillant control of labour and a datafication of livelihoods as they are explored in contexts of the USA or the UK (De Stefano 2015, Wood et al 2019, Van Doorn & Badger 2020). In the global South, such gig-work platforms continue attracting attention and investment, citing their employment generation potential as a critical factor (BCG 2021).

Similarly, digital identity technologies are also part of the 'Big Data divide', attracting scepticism and questions of surveillance risk in the global North, but celebrated as a solution to marginalisation in global South settings (McCarthy 2016, Cinnamon 2020). This disconnect can be seen prominently as many global South nations venture into large digital identity programs on their way to address one of the United Nations 'Sustainable Development Goals' (SDG) to provide legal identity for all by 2030 (Target 16.9). Digital identity infrastructure and biometric surveillance form a significant part of such responses led by the UN's legal identity expert group's recommendation (UNLIEG 2019). But wider research warns of the surveillance risk and potential data-driven discrimination due to lack of data protection, particularly in global South settings (Beduschi 2019).

This thesis contributes to this debate by conceptualising the social impacts on the already marginalised population in defining their newfound digital participation as 'inclusion' within digital platform ecosystems, which is still a largely under-researched phenomenon. The thesis contributes to

research on digital platforms within IS and ICT4D literature, querying the complex meshing of surveillance, inclusion and datafication, across the ecosystem rather than in one particular context. So, the task for this thesis is to recast the intimately related ideas of datafication, surveillance and inclusion by taking into account individual contexts of marginalisation both outside and within digital platforms and the wider ecosystems they inhabit.

The rest of this chapter signposts the research background of this thesis by briefly defining the multiple relevant parts of India's complex digital platform ecosystem within which Aadhaar and gig-work platforms are present. The chapter then continues presenting the research, the overall research strategy, and discussing the fit between the constituent papers of this thesis.

1.5. Research Background - India's Platform Ecosystem

This immediate section presents an overview of the Indian digital platform ecosystem. At the outset, a discussion of the ecosystem is relevant to signpost the multiple platform entities mentioned across the thesis. But this section also sheds light on the intricate technical and social connections within the ecosystem and justifies the need to study platforms embedded within a wider meta-organisational context.

The digital ecosystem under study here revolves around a central platform – Aadhar. Here, Aadhaar aims to 'guarantee' each Indian resident a 'digital identity' verified for non-duplication using biometric information. The program is planned and implemented by the Unique Identity Authority of India (UIDAI), which oversees the digital identity ecosystem. Since its inception in 2009, Aadhaar has been a relatively novel technology that has gathered various moving parts and increased the range of services it offers along the way. Consequently, Aadhaar's history is an evolving tapestry of changes seen across the years. Aadhaar was presented in 2010 as a means to verify citizens when using governmental welfare and benefits (The Hindu 2010). In 2012 the Aadhaar architecture was advanced to enable 'online verification' by private entities, particularly telecom companies and banks (ET 2012). Aadhaar since then has been used for a variety of services like opening bank accounts, receiving subsidies, or direct benefit transfer (Sarkar 2014, UIDAI 2014a, 2014b). Enrolment itself is 'non-mandatory' and is to be demand-driven by the markets in which Aadhaar is used.

The system works using biometric data – iris scans and fingerprints which 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 as a platform espouses an 'open' architectural principle to ensure interoperability. So, Aadhaar uses standard APIs (application programme interfaces) - software systems defining the interaction between Aadhaar's database and

other services using the digital identity. The services within the platform ecosystem use the 'verification' of Aadhaar enabled through this API to do two things. First, those who connect to the API can 'verify' if an individual is who they claim to be. Second, the service can also verify if the demographic and personal information submitted by the individual matches the information held on Aadhaar's database. Aadhaar needs to be linked to a mobile phone number to achieve this online verification. Then verification can be done by using biometric matching when relevant devices are available, or verification can be done online. During verification of an Aadhaar number, a 'One-Time-Password' (OTP) is sent to a mobile number linked to the Aadhaar number, which acts as a security measure (UIDAI n.d.).

Additionally, offline verification is also done in three ways, (i) XML (Extensible Markup Language) files, (ii) QR (Quick Response) codes or (iii) through mobile phone app of Aadhaar. In the case of Aadhaar XML, the customer downloads an XML file with their demographic information. This file, when shared, is readable by the verifier using XML compatible software to retrieve the personal data. Offline verification can also be conducted by scanning the QR code as an image downloaded from UIDAI website or printed on downloaded Aadhaar documentary form (called colloquially as 'Aadhaar card'). The same QR code is available on mobile phone apps as well. As long as either the XML file or the QR image is presented, the verification of Aadhaar and its data do not need OTP to be confirmed – and thus are offline (UIDAI n.d.).

Aadhaar's conceptualisation and implementation thus strongly reflects the practice of datafication. The ethos of datafication was spearheaded by proponents like the 'India Stack' – a non-state collective of technocrats whose expertise and knowledge exchange directs the adoption of Aadhaar as a datafication solution across the public-private divide (IndiaStack n.d.). This has resulted in a situation where even when the state does not have to collect humongous data directly, a move towards datafication increases the opportunity for convergence of a variety of data sharing practices, especially with Aadhaar involvement with digital payments and gig-work as discussed in this thesis. The open architecture of Aadhaar was further built upon to deliver other API based digital services provided by India Stack and to be used across public and private sector situations, forming the basis for a digitally-driven financial inclusion (Dattani 2020).

India Stack has four layers that enable specific complementary services (IndiaStack n.d.). The first 'presenceless layer' functions to enable Aadhaar based verification remotely (using OTPs and APIs) without the identified individual needing to be present physically. The second 'paperless layer' is where digital records and digitised paper documents are encrypted and stored. Here Indian government provides a service called DigiLocker, which works as an Aadhaar based digital vault. The

first two layers provide 'Know Your Customer' (KYC) services – the mandatory identification and verification process used chiefly in financial services. But others, like the telecom sector, have adopted the KYC process for verification.

The third 'cashless layer' pertains to a 'unified payment interface' (UPI) which connects banks account with Aadhaar and the linked mobile number to provide digital payment services. The overlap of Aadhaar with gig-work came mainly in 2016 with this implementation of UPI bringing together a bank agnostic digital payment system using mobile phone apps. Here, UPI acted as the middle layer of digital platform connecting multiple banks and other commercial services to accept and provide digital payment. This service was built with Aadhaar as the digital identity. As long as individuals had a registered mobile phone number and a bank account linked to Aadhaar they were provided access to digital payments. In effect, payments using a unique UPI financial identifier can be made and taken by anyone who verifies and links their mobile number and bank account with Aadhaar (IndiaStack n.d.).

The final layer of India Stack is an evolving consent framework named DEPA (Data Empowerment and Protection Architecture). Based on informed consent, DEPA enables data-sharing across services and other platforms which connect to India Stack as 'open personal data store' (IndiaStack n.d.). These various services offered by the India Stack then in used by the wider ecosystem as building blocks to access verified data on those who come under Aadhaar, and using that offer other digital services. Thus Aadhaar has made it possible for individuals within the platform ecosystem to be approached as potential platform users by multiple private sector players.

The ecosystem under study has different services, each delivered by a distinct category of platforms, though Aadhaar and gig-work platforms remain the primary focus across this thesis. These are digital trust platforms, payment platforms, credit platforms, job portals and gig-work platforms. These use Aadhaar, India Stack and KYC services to various degrees (seen in figure 1 below and which are detailed further in the empirical discussion in each paper/chapter). A trust platform is an intermediary between those seeking to provide services or employment to the previously unbanked and undocumented users who are now entering the digital economy (Betterplace n.d.). So, marginalised workers regularly provide Aadhaar verification documents to 'blue-collar' job recruitment portals or gig-work digital platforms. The function of trust platforms is to serve the other platforms described here by undertaking API based verification of Aadhaar and other documentary verifications.

Digital payment platforms used on smartphone apps are linked to Aadhaar, their mobile numbers and the banks accounts. This linking is provided by UPI to enable digital financial transactions. Credit platforms utilise the services of both trust and digital payment platforms to provide direct access

to loans for their users. Finally, gig-work platforms are connected to services from the three others. Gig-workers are verified using Aadhaar and other documents using trust platforms when they take up employment. Workers undertake digital payments for their daily work and interaction with customers. Credit platforms that use digital payments and in partnerships with gig-work platforms provide loans to gig-workers (OMI 2021, Avail Finance n.d., OnGrid n.d.). This complex interaction of the constellation of platforms is represented below with examples of each platform (figure 1).
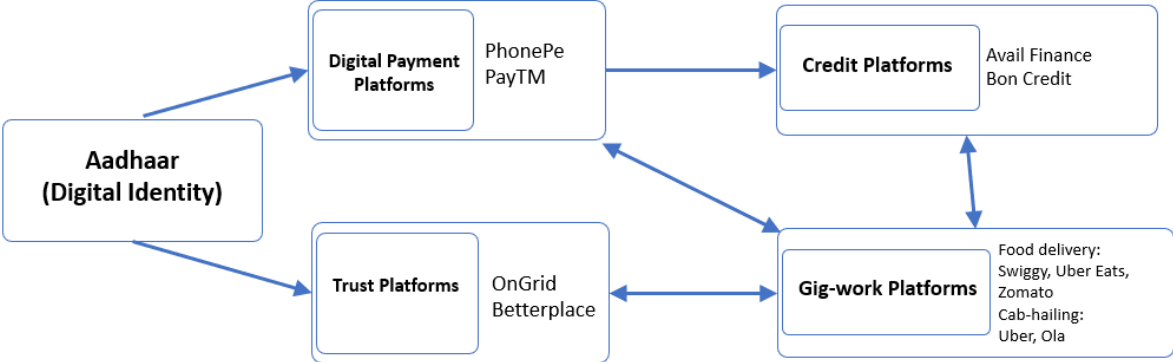
The various platforms with their examples are as connected to Aadhaar and Gig-work. The arrows depict the functional connections and flow of data between platforms.

Figure 1.1: Overview of India's platform ecosystem

1.6. Thesis Overview

The research project consists of three constituent papers, which form this thesis presented as an alternative format to a monograph. These three papers trace the experience of informal workers across the ecosystem discussed above. This thesis conceptualises inclusion and surveillance being performed by multiple means of datafication inherent to digital platform technologies. As later chapters will elucidate, the thesis views surveillance within the platform ecosystem as a complex arrangement of multiple visibilities (Brighenti 2010, Lyon 2016). Particularly, surveillance is considered under the lens of 'liquid surveillance' (Lyon 2010, Bauman & Lyon 2013). This research framing informs the thesis's research engagement with various contexts of surveillance, seen in the use of Aadhaar as an identity, in Aadhaar-based verification of data, the generation of data, its analysis and processing in multiple platform contexts, the sharing of data between platforms and also the advent of algorithmic mechanisms within specific platform contexts.

Further, inclusion is approached as a multi-dimensional construct under a social justice lens. This thesis casts inclusion as an intersectional construct with cultural, economic, and political dimensions under an 'abnormal justice' lens (Fraser 2008). This view of inclusion is demonstrated to be synergistic with surveillance and datafication inherent to the platform technologies, specifically digital identity. By juxtaposing surveillance and social justice, this thesis takes a page from the recent scholarship on 'data justice' (Dencik et al. 2016, Heeks & Renken 2018).

1.6.1. Research Questions and Paper Structure

Using the twin lenses of surveillance and social justice to view the digital platform ecosystem has influenced the overall research question and how the three constituent papers are structured to answer this question. Successive phases of fieldwork, data-collection and engaging with theory inform the research questions and the strategy.

Thus, the overarching research question is: "*How are inclusion and surveillance, and their paradoxical relationship, performed through datafication in the digital platform ecosystem*?".

To answer this question, the research design involves engaging with three interrelated perspectives of the ecosystem. These broadly match the three constitutive papers as seen in the table below (Table 1.1) and their levels of analysis presented. The following is a brief overview of the three papers.

Paper	Title	Research Question	Focus of Analysis
1	Digital Identity, Datafication and Social Justice: Understanding Aadhaar use among informal workers in south India	*What is the social justice impact of digital identity and the datafication enabled by it?*	In between Aadhaar – digital identity platform, job recruitment portals and gig-work platforms.
2	Spatiotemporal (in)justices in digital platforms: An analysis of food-delivery platforms in south India	*What are the social justice impacts of the spatiotemporal characteristics of digital platforms?*	Within food-delivery gig-work platforms.
3	Liquid Inclusion: The dynamics of inclusion under datafication and surveillance	*How is inclusion performed under the datafication and surveillance practices of digital platforms ecosystems?*	At the level of digital platform ecosystem.

Table 1.1: Details of the constituent paper in this thesis

Beyond the findings presented, the first paper signals the varying experience of workers dependent on their particular work contexts. It influenced the second paper, where the thesis identified a need to zoom in-to the narrower contexts of particular platforms and explore the variation of datafication and surveillance. This is further connected back in the third paper, which builds on papers 1 & 2 to present a digital platform ecosystem level view. Supporting these papers, the empirical data was collected by engaging directly with the context of the workers and plotting their trajectory across the platform ecosystem.

Paper 1: Digital Identity, Datafication and Social Justice: Understanding Aadhaar use among informal workers in south India

Research question 1: *What is the social justice impact of digital identity and the datafication enabled by it?*

This paper studies Aadhaar, focusing on its use by two marginalised groups of informal workers seeking entry into the digital economy. These are domestic workers seeking work on 'blue-collar' job portals and cab-drivers working under a digital gig-work platform of cab-hailing apps. This paper presents 'abnormal justice' as a conceptual framework to theorise cultural, economic and political dimensions of participation using Aadhaar in commercial work contexts. The findings present a critical view of digital identity use, the attendant datafication and dataflows. The research uses empirical evidence of semi-structured interviews and field observations. It is found that digital identity is intimately related to inequality experienced by the informal workers in three ways: current use of digital identities reifies extant cultural disparities experienced by the workers; unprotected datafication exploits the new-found digital participation to create further economic inequalities, and unfair and complex barriers continue to exist for marginalised workers to voice 'informed consent' or to access redressals for security issues.

Paper 2 : Spatiotemporal (in)justices in digital platforms: An analysis of food-delivery platforms in south India

Research question 2: *What are the social justice impacts of the spatiotemporal characteristics of digital platforms?*

The second paper presents a zoomed-in view of the micro-level negotiation of digital platform labour and data practices. This paper involved the study of three food-delivery platforms and found that in the performance of gig-work, (in)justice is experienced spatiotemporally by gig-workers. Specifically, surveillance and datafication of spatial and temporal are seen to be inherent to the daily

work practices in gig-work. The qualitative methods used include semi-structured interviews of food-delivery workers and an autoethnographic study by the author as a gig-worker on digital platforms.

Paper 3: Liquid Inclusion: The dynamics of inclusion under datafication and surveillance

Research question 3: *How is inclusion performed under the datafication and surveillance practices of digital platforms ecosystems?*

The third paper in this thesis analyses the worker's experience at the platform ecosystem level by tracing their experience across Aadhaar, gig-work and other platforms of digital payments, trust and credit services. Here the performance of surveillance in enabling inclusion is queried using a lens of 'liquid surveillance'. The analysis shows inclusion to be a potentially positive outcome of data-driven surveillance. Inclusion is seen here in the transition of the worker's status as an informal worker to becoming a gig-worker in three main ways: of seeking formal documentation and legal identity under Aadhaar, of seeking financial betterment and participation under digital payments and credit platforms, and of digitally intermediated formalisation of employment status. But inclusion is found to be performed under a liquified and fragmented environment of work and livelihood. Under these conditions, inclusion is exposed to be dictated by episodic tasks of self-surveillance rather than being an absolute positive benefit of belonging within the digital economy.

Building on the above presented three papers, the following chapters cast the ostensibly paradoxical relationship of surveillance and inclusion as the surveilled individual having to walk a tightrope of competing visibilities. There is a need for positive and necessary visibility to the state and other private players to achieve 'inclusion'. This is set against the negative impacts of surveillance visibility, like denial of rights and risks to socio-economic justice. Thus, the thesis studies 'surveillance' as performed by complex visibilities and as an essential element of digital platforms as faced by the marginalised population. This surveillance in turn, results in complex participation seen through a social justice lens, especially to go beyond the prevalent economic dimension of inclusion.

The rest of the thesis is structured as follows. Chapter 2 presents a wide reading of literature on digital platform, and their ecosystems. Here both perspectives on platforms as venues of inclusion and surveillance are presented, along with a focussed review of research on digital identity and gig-work in the Indian context. The chapter also presents specifically identified gaps in the literature and justifies the use of a data-justice framing done in this thesis.

Chapter 3 delves into the specific theorisation of surveillance and inclusion as theoretical constructs. The chapter engages with the literature of liquid surveillance, integrating this with readings

on abnormal justice. The last section in this chapter summarises the theoretical concepts as used across this research project.

Chapter 4 presents the methodology, detailing the research philosophy, the various method and data-collection tools employed. The chapter ends with details of data analysis with a summary of the same as it applies to the three contexts of the constituent papers.

Chapter 5 is made up of the three constituent papers as presented earlier in this introduction.

Chapter 6 is a critical evaluation of the entire project. Here, the various theoretical constructs are revisited and observation is made to cast inclusion within digital platforms both as a process and outcome. The chapter ends with a discussion on the interdisciplinary contributions made by this thesis, its limitation and wider implications to practice and policy.

2. LITERATURE REVIEW

This chapter reviews research on digital platforms within literature from IS, ICT4D and further interdisciplinary research from fields such as data studies, surveillance studies and development studies. The chapter continues by scoping out varying perspectives on digital platforms the constructs of datafication, surveillance and inclusion. The later part of this chapter reviews existing research within the Indian context that studies the social impact of datafication and digital platforms. In this, particular attention is given to two categories of digital platforms dictated by the empirical focus of this thesis. The first is of Aadhaar as a governmental digital identity platform, and the second is digital gig-work platforms. The review in this chapter results in a synthesis of the gaps in the literature that this thesis addresses.

2.1. Digital Platform Ecosystems: A problematisation

In the last decade, digital platforms have entered the popular and academic vocabulary, becoming a prominent means of understanding commercial and, equally, governmental services (Srnicek 2017). One reason for this is because digital platforms and its underlying Big Data technological capacities work to scale up rapidly and thus be made available to a large section of populations as their users (Flyverbom 2019). A logical outcome of this capability, and one which is studied closely in this thesis, is the notion of 'inclusion' that platforms afford to their users. As digital platforms increase their footprint across the technology landscape, millions of first-time users get included into a newly minted digital presence (Arora 2016).

Inclusion, as conceptualised here, can be brought about by two broadly related means. First, governmental interventions deploy digital technology to improve access to services across both public and private sectors. Governments have an essential role in encouraging the contemporary digital transformations under platforms in both the public and private sectors. National governments routinely extend the reach of underlying infrastructure such as technical networks or mobile phone penetration to support a platformisation agenda (Brown et al. 2017, De Reuver et al. 2018). The use of platform technologies to perform governance has also been increasingly noted as an emerging and vital phenomenon to be studied (Benlian et al. 2018).

Secondly, there is increasing participation within the digital economy using commercial platforms of the hitherto excluded individuals. The term 'platform' routinely attracts attention to prominent commercial entities providing online services (such as Google) or sharing and gig-economy services (provided by the likes of Airbnb or Uber) (Srnicek 2017). In fact, most of the prominent technology businesses encountered online are now considered platform companies (Cusumano et al.

2019). Governments globally have begun echoing commercial digital platforms provision of online public services, thus blurring what a platform could be (Evans & Gawer 2016, Benlian et al. 2018). This view is further complicated when considering the wider context of platforms. As Poell et al. (2019) term the rapid advent of platform entails:

> …the penetration of the infrastructures, economic processes, and governmental frameworks of platforms in different economic sectors and spheres of life (Poell et al 2019, no pagination).

Platforms thus occupy an amalgamated public-private space. They also inhabit a complex socio-technological 'platform ecosystem' consisting of multiple platforms and stakeholders, all brought together with networked capabilities, enabling data flows between them in various ways (Jacobides et al. 2018). Essentially, platform ecosystems signal the spreading overlap in public and private sector roles that individuals navigate as they gain digitally-enabled inclusion.

A competing view of digital platforms paints a darker picture of the individual's experience. Wider critical research majorly studied within global North contexts positions surveillance and data extraction as a negative impact of platforms. Platforms are intimately linked to the emergence of 'datafication' as a common phenomenon in both governmental and commercial digital contexts (Poell et al. 2019). Datafication as it is seen in contemporary society resorts to the capabilities presented by 'Big Data' paradigm. Social contexts, actions of individuals within digital platforms, and the impact of these platforms are all seen to play out in a quantified and datafied form (Mayer-Schoenberger & Cukier 2013, Van Dijck 2014). In fact, accumulating data on user's behaviour, preferences and social activity is considered a primary factor for the success of platforms and forms a central point of innovation (Helles & Flyverbom 2019).   The data extracted of users and exploited for its commercial value by complementing entities within the ecosystems forms both the commercial and technological basis for digital platforms (Poell et al. 2019).

Datafication in this context enables data-driven surveillance in both governmental and private platform contexts. This means tactics like 'data analytics' emerging from the corporate technology sector increasingly find their place in governmental processes (Flyverbom & Garsten 2021). With data analytics, the citizen is gradually being treated implicitly as a data-subjects, as Taylor & Broeders (2015) present. There is a transformation in how governmental programs are set up, with the state-citizen engagement becoming increasingly data-driven. All this works to enable the user's profiling based on the data-mining of their digital footprint across the platform. The multiple 'digital traces' that individuals leave can be mined as data by corporate and governments alike, to undertake surveillance (Flyverbom 2019). This data mining aims at economic or financial value creation for the platform's various commercial entities, such as the different entrepreneurial suppliers in the ecosystem (van Dijck

2014). In the case of governmental use, data mining can be directed towards economic efficiencies and improve policymaking (O'Reilly 2011, Margetts & Naumann 2017).

The impact on the individual who parts with their data then depends on the platforms' ethical context. Under what Zuboff (2015) famously termed 'surveillance capitalism', this accumulation of data generated is often to the detriment of some of the most vulnerable individuals in society. Clarke (2019) states that the extraction of data reduces the humanness of contexts and thus increases the risk of unethical impact on individuals and institutions alike. Darmody & Zwick (2020) further qualify that platforms manipulate consumers into a sense of having a choice and attaining empowerment through data-driven surveillance, even as they are pushed towards conformity in aiding value creation for the platforms.

This thesis is situated at the intersection of these two ostensibly opposing streams of research. One view is that platforms have the potential to improve the inclusion of those underserved into a digitally intermediated society. The other view questions the vast surveillant capabilities and how this is put to use by governments and corporations. The problem for this thesis then is to conflate surveillance and inclusion as an outcome of the same capability of datafication within a platform ecosystem. The following few sections present relevant literature on the roles of governmental and commercial digital platforms in society. The chapter continues signposting literature on the empirical context of the chosen case studies of the governmental digital identity program in India (Aadhaar) and on digital gig-work platforms in India.

2.1.1. Platforms as Sites of Datafication and Surveillance

This section brings together information system perspectives of platforms and broader approaches to surveillance by widening the review's ambit to disciplines such as surveillance studies and data studies.

There are various defining characteristics of platforms that this research is interested in exploring. Poell et al. (2019) present an excellent beginning point to understand platforms and their connection to surveillance. They suggest that an underlying data-infrastructure and prevalent datafication of governmental and commercial processes are critical to the functioning of digital platforms. Particularly in an information system view, platforms are built up of complex networked and layered digital components and subsystems. These multiple moving parts that make up the platform are built to deliver a 'modular' and 'open' architecture (Yoo et al. 2010, Rolland et al. 2018). Openness, termed 'generative' architecture, allows platforms to accommodate a rapid scaling up, allowing for platforms to interface with other platforms and technological entities using complementary technical standards. This results in different systems being able to talk (technologically speaking) to each other and, more importantly, share data seamlessly (Jacobides et al. 2018). The

platform then inhabits an ever-changing ecosystem that includes autonomous collections of developers, corporations and institutions expanding the digital platforms' form and function.

This deployment of generative capabilities that began within the private sector is already adopted by the public sector in its digital delivery of services. Principles of open architecture surfaced early as a core concept within what was termed as the 'Government as a Platform' (GaaP) construct (O'Reilly 2011). Governments globally are more recently poised to provide services through partnerships with commercial digital platforms (Ganapati and Reddick 2018). Public services in this mode aim for citizen participation, alongside enabling digital services through a 'mashup' of dependent and subsystems that make up the GaaP ecosystem as a whole (Brown et al. 2017). As the ecosystem becomes the site of commerce and governance, digital strategies adopted by institutions have shown profound changes. Digital technological projects are no more mammoth, top-down and proprietary activities. Platforms, including in the public sector, espouse an agile, responsive and malleable approach to their growth (Margetts & Naumann 2017).

Riding the coat tail of platformisation of infrastructure, surveillance too is seen to be platformised. As Wood & Monahan (2019) argue, there is a particular flavour to 'platform surveillance' in their transformation of 'social practices and relations', making them 'exploitable as data'. Zuboff (2015) argues that the traditional role of a powerful entity undertaking surveillance being the state as a 'Big Brother' which held a top-down power watching over citizens, is replaced with the 'Big Other' of digital platforms. Under datafication, surveillance is not hierarchical but networked, and the powerful don't have to watch over constantly. With datafication:

> …events, objects, processes, and people become visible, knowable, and shareable
> in a new way. The world is reborn as data' (Zuboff 2015, pg. 77).

In this context, a quick look at the global history of surveillance and its relation to data collection provides some key insights. Globally, surveillance is seen to be framed by two specific events: the 9/11 attack and the Snowden revelation of the globalised surveillance programs. In the immediate aftermath of the 9/11 attacks, technologists and 'high tech' companies were placed directly in the middle of the governmental response, enabling the proliferation of technical solutions focused on disparate data collection as a means of surveillance (Lyon 2003). With heavy governmental investments, data-mining aimed at surveillance was adopted globally by the technological and commercial sectors. In its new form, this data-driven surveillance was employed to make sense of the bulk of commercial transactional data and create customer profiles (Gandy, 2007).

Datafication went further in later years as technologies developed, and there were two relevant developments in the post-Snowden era of surveillance (Lischka 2015). One is the acknowledged routinisation of 'Big Data' proponents placing unerring faith in technology-led solutions.

The second is the close public-private synergies in datafication, particularly involving information technology companies. Both these mean that at many points, the use of data involves unwitting user-involvement as a 'data subject' in handing over their data which flow through these complex synergies to create value to public and private sector entities (Lyon 2014). This is enhanced further with social media's global success, which ostensibly contributed more intimate personal data to Big Data surveillance (Ball 2017). The features of Big Data surveillance in itself then includes normalisation, convergence and interconnectedness of a variety of datasets with emphasis on high-volume datafication and high-speed processing and analysis (Stark & Levy 2018, Wood & Monahan 2019).

The interdisciplinary corpus of literature on public sector and commercial platforms also illustrates the changing surveillance modes under datafication. Relevantly to this thesis (and not coincidentally), typical examples of such platforms would be governmental digital identity and commercial gig-work. Both digital identity platforms and gig-work platforms are sites of datafication. They share a similar arc in becoming means for a newer form of data-driven surveillance deriving from more traditional surveillance undertaken by the state and employers. The change in research thought about these platforms and their surveillance capabilities is traced briefly below.

Within studies of digital identity, Breckenridge (2005) provided an early critique on the digital government using a biometric identity infrastructure in South Africa. Two salient points are put forth in this work which points to the evolving nature of surveillance. The 'biometric state' and its citizens are cast under a 'panoptic' centralised surveillance visibility of this national identity infrastructure (Breckenridge 2005, pg. 278). Surveillance risk considered under such identification regimes is concerned with both overt and covert practices of being watched by and becoming visible to the state (Lyon 2009, Lyon 2017).

At this point, the concern of surveillance goes beyond the issue of the 'state'. As Breckenridge (2005) pointed out, private entities were involved in enabling identification in even its early versions. The state espoused commercial principles by casting the citizens as 'customers'. Interestingly, there is also a hint of the state's datafication ability that identification systems afford. Breckenridge (2005), in the concluding sections of his research, calls for a deeper understanding of what he terms is a 'datasphere' that attracts mundane and private data of individuals being collected as part of the surveillance they experience under a biometric state. This is but an idea of a proto construct of data-driven surveillance, acknowledged later under Big Data (Andrejevic & Gates 2014, Martin & Taylor 2021). The advent of social media and increased digital mediation in society has only bolstered the relationship between a governmental digital identity and the wider commercially-driven digital society.

As biometric technologies took up the mantle of identification across many nations (Bennett & Lyon 2013), there has been growing academic interest in understanding its implications. But recent

scholarship squarely positions these identification systems and their functions as socio-technological mechanisms of datafication (Ajana 2020, Weitzberg et al. 2021). Specifically, the continuing growth of technologies like biometrics which bridge the gap between identification and datafication, especially in the Global South, has been identified as a crucial research agenda in the last decade (Arora 2016, Schoemaker et al. 2021). The deepening of datafication within digital identity as platforms is reflected in the construct of 'data-driven identities' (Masiero & Bailur 2021). As these systems fall into the wider net of Big Data, adopting datafication tactics and become platforms, identification too then becomes a process of data-driven surveillance (Van Dijck 2021).

A similar account of datafication and surveillance is found in commercial digital platforms' evolution. Given the focus of this thesis on gig-workers experience, a relevant idea is surveillance within digitally mediated workspaces and labour practices. Monitoring of workers as a way to control their productivity has been the mainstay of deploying information technology in organisational contexts. An evolving view of workplace surveillance has been related to the collection of data. In early analysis of surveillance within the workplace, Zuboff (1988) deploys a 'panoptic' metaphor to present that information technology was a tool that monitors and measures employees in an organisational context. This as real-time surveillance entailed the collection and storage of data. Clarke (1988) notably used the term 'dataveillance' to denote the systematic way data is collected to aid the monitoring of productivity and performance and the control of behaviours, actions and communication of individuals as employees.

Datafication of workplace surveillance is considered to increase employers' scope of control and monitoring. This is also seen where the extraction of personal data about an individual worker and their labour has seen 'function creep' (Ball 2010). This can be either from excessive data and information collected than the monitoring ethically necessitates, or it could be due to data being put to uses for reasons other than those originally intended. Ball (2010) also present three specific ways in which surveillance was emerging that are of interest to the recent developments in datafication. They discuss that there is increased use of personal data, the use of biometrics as a tool of employee surveillance and growing covert surveillance undertaken by employers.

These issues are analogous, but more evolved technologically, to how surveillance plays out within gig-work platforms. As Newlands (2021) argue, with newfound datafication and surveillance capabilities, gig-work platforms automate surveillance to the extent that the workers are watched and monitored by algorithms instead of a human observer. The body and physical efforts of the gig-workers are recast as data representations. This erasing of individual human differences of the workers allows the algorithm to see an objectivised view of individuals, facilitating automated control and decision making. Wood et al. (2019) argues similarly about surveillance and control, and point out that these algorithmic actions are covert and unknown to the surveilled worker.

2.1.2. Platforms as Pathways to Development and Inclusion

This second perspective that this thesis seeks to study is on the impact of platforms within the global South as potential vehicles of positive development. Particularly inclusion as a positive outcome in using ICTs and digital technology has seen multiple evolving interpretations. This review will arrive at the context of inclusion within platforms as seen in contemporary times by tracing these.

Early views of the relation of ICTs to inclusion presented a unidimensional 'digital divide' view, of excluded individuals being able to participate by the mere provision of technological resources. Here inclusion is of those who have access to technology against those who do not. Warschauer (2003) rightly critiqued the 'digital divide' framing as too restrictive in its definition of inclusion and that social inclusion (and exclusion) needs to factor in multiple social resources. An effort to understand the broader context of inclusion has gained prominence within studies of IS and ICTs. For instance, Zheng & Walsham (2008, 2021) reposition their argument that inclusion as the impact of government ICT policy needs to go beyond mere technological provision to pay greater attention to the socio-political, cultural and institutional factors. Conceptualisations of social inclusion then went further to account for wider inequalities and marginalisation conditions. Inclusion was recognised as being not only about economic development, but also political and cultural factors (Trauth & Howcroft 2006). Other researchers (Cushman & McLean 2008, Urquhart & Underhill-Sem 2009) echo this point by giving attention to underlying issues due to social factors such as gender, race and class.

Critical research into the social impact of ICTs challenges the notion of technology being an undebatable force for good and seeks to understand social exclusion and other negative effects of technology (Trauth & Howcroft 2006). The aims of ICTs research then evolved from knowing how to connect marginalised individuals to a technological solution to understanding how to pass on the positive impact of technology (Galperin 2010). Researchers also acknowledge that ICTs can exacerbate and even cause marginalisation (Tambulasi 2009). This signalled that impact of technology needs to be studied contextually beyond mere access or adoption.

A view similar to the inclusion potential of ICTs can be found in discussions on social impacts of 'digital platforms'. Despite the surveillance risk, platforms are becoming vital to the inclusion of marginalised individuals into an emerging digital economy. The main category here is of digital identity platforms. Positioned as 'identity for development', the efforts for universal digital-led inclusion depend on these identities as legal and formal documentation for undocumented (Gelb & Clark 2013), specifically as it applies to the global South (Dahan & Gelb 2015).

A narrative of inclusion is commonly seen in studies of digital identity and other identification infrastructure. Especially if implemented as a national system of identification, identity cards and identification artefacts also tend to become a stand-in for legal inclusion or even defining citizenship

(Lyon 2017). This conflation of identification and inclusion mirrors ICT4D's tradition of considering technology as a tool for the betterment of society. The stated aims of many such projects are studied as ideals of poverty eradication (Harris 2004, Duncombe 2006) or financial inclusion (Kpodar & Andrianaivo 2011, Bisht & Mishra 2016). Along these lines, in the last few decades, governmental use of national identity systems and related identification technologies has been shown to address social inclusion (Bennett & Lyon 2013, Whitley & Hosein 2010).

At its core, identification is understood as a function of inclusion, establishing a way for those excluded to be trusted and seek participation under an identity mediated interaction (Cameron 2005, Bennett & Lyon 2013). The path of identity as legal inclusion is also solidified under the UN Sustainable Development Goals (SDG) 2015. Specific SDGs place a square focus on 'inclusion' and call for the promotion of 'inclusive societies' (SDG 16) and present target (of SDG 16.9) to 'provide legal identity for all, including birth registration' by 2030 (UN 2018). SDGs have also spurned an increase in the focus on datafication. As online services become common, SDGs fall under the ambit of digital identification technologies, their function of datafication and also by being construed as platforms (Masiero & Bailur 2021). There is a clear call to understand digital identity as a platform for addressing SDGs (Beduschi 2019, Madon & Schoemaker 2021).

Financial inclusion is yet another layer of inclusion entwined with an expectation of a digital identity for individuals (Beduschi 2019). Services in the wider platform ecosystem like digital payment platforms are consistently linked with expectations and outcomes of financial inclusion (Gelb & Metz 2018, Qureshi 2020). Platform services are regularly involved in enabling the participation of the previously unbanked into formal banking or providing access to credit (Demirguc-Kunt et al 2018). Here, digital identity becomes the route to establishing trust or security for online financial participation. Similarly, evolving 'fintech' platforms are considered valid 'pro-poor' opportunities for delivering financial inclusion (Lagna & Ravishankar 2021). Notably, Cheesman (2020) warns that many large platform companies use the promise of financial inclusion to become digital identity centric gatekeepers.

In a similar context, Brewer et al. (2015) present a gap in understanding what inclusion stands for given the variance of global context in digital identification. Bennett & Lyon (2013) offer a relevant point contextualising identity systems' use globally. They contend that there is an observed dissonance. While 'rich' states have moved away from governance regimes using national identity schemes, there is increasing use of national identity or related projects in the Global South (see for examples: Bozbeyoglu 2011, Fluri et al. 2015, Gelb & Metz 2018). There have been vehement opposition to national identity programs in global North countries or they come under strong data protection policies that mitigate the risk of state surveillance overreach (Whitley 2013). The socio-political context of identity as a platform and their positive and negative implication in the Global South

are, in this debate, under researched. Bennett & Lyon (2013) place a related call to scrutinise the voluntary versus mandatory situations of using a digital identity. They consider that increasingly mandated identification disadvantages minority communities by making surveillance and the consequent social classification an adverse reality.

This emergence of opposing consequences has been flagged in the context of the 'social inclusion' aims of identification technologies. This signals a need for a deeper understanding of the objectives and mechanisms of national identification regimes. For instance, in their study of Brazil, Wood & Firmino (2009) argue that identification as a technological and social construct has two oppositional poles – repression and inclusion, and neither of these outcomes is predominant due to identification. While in Brazil the specified agenda for the identification regime is of inclusion, Wood & Firmino (2009) find that 'inclusion' is not a well-defined outcome. There is a mixed result in w hat inclusion means, especially given the potential of abuse of power an integrated national identification system brings to the Brazil's global South context. They strongly signal a need to investigate inclusion and exclusion conditions, contextualising the potential for surveillance under a national identity program.

A broad critique of digital platform and its role in enacting inclusion is given by Masiero & Arvidsson (2021). They argue that the underlying design of platforms intended for inclusion can have unintentional 'degenerative' impact and that inclusion is not always a given outcome. Others take a more anti-capitalist tone. That platforms with their capitalist and data extractive position necessarily negatively impact the most vulnerable of those who participate. In this Díaz Andrade & Techatassanasoontorn (2021) reject the notion of inclusion as an outcome. They discuss that participation that can only be digital means there is 'digital enforcement' rather than it being an inclusion that is sought after. A similar argument is made by Heeks (2021) that platforms enact an 'adverse digital incorporation', shifting the perspective that some groups of actors participating within platforms are necessarily exploited as a way to create value for others groups in dominant positions. Other studies warn of the similar deepening vulnerabilities under platform-driven surveillance (Hosein & Whitley 2019, Martin 2021).

Digital platforms are also increasingly seen as an important means of participation in the labour market, particularly in the global South, as erstwhile informal employment is rapidly seeing mediation by digital technology (Rangaswamy 2019). This change is not without its challenges, as frictions exist where marginalised individuals face barriers to participation in the digital economy. Not all groups are provided equal digital access (Koskinen et al. 2019, Bonina et al. 2021). Gig-work platforms are also considered a significant source of employment and potential socio-economic development (Ahsan 2020). Relevantly, gig-work is acknowledged as a means for inclusion into the formal economy, despite their platform-imposed surveillance and control of work (Heeks et al. 2021).

From an inclusion perspective, even when platforms create employment opportunities, exclusion can still occur for groups already facing marginalisation due to gender, disability or age (Heeks 2017).

Koskinen et al. (2019) very relevantly call for a need to understand the inclusive impact of platforms in the global South by querying 'what a digital platform is and how they should be conceptualised' as agents of development. They further highlight two specific points which support this thesis's motivation to take a 'platform' perspective. First, platforms are acknowledged to be intertwined with surrounding institutions, markets and digital technologies, and second, governmental platforms as technological innovation are rarely viewed from a platform perspective. Heeks (2020) similarly presents a 'digital for development' paradigm where digital technology moves from 'development tools' to become 'development platforms'. They argue that an increasing digital 'platformisation' with networked capabilities spanning the public and private sector forms the basis for digital led development within the global South. Similarly, Masiero & Nicholson (2020) present one of few works of research that co-position platform logics and development where they discuss digital platforms and their limits as emancipatory technology.

The choices made by platform companies on their technological features and business models directly relate to how inclusion plays out within their remit. Practices of algorithmic control and unequal power distribution within the platform's market ecosystem negatively affect the marginalised users (Wood et al. 2019). Thus, even when economic benefits can be associated with platforms, individuals can face exclusion and inequality due to the outcomes of platformisation (Malik & Wahaj 2019). Within these studies of digital platforms, the concepts of inclusion are handled at best indirectly. There is a dearth of research exploring inclusion as being connected to the core logics of digital platforms. Inclusion in such a view would be a complex outcome subsuming access to digital platforms and contending with both the positive and negative socio-economic impacts.

2.2. Contextual Research

This section presents contextual research on platforms focusing on Aadhaar, the digital identity program, and on gig-work platforms in India. This review of research related to the empirical case showcases the gaps in how the specific platforms and the larger ecosystem are studied in prevalent research.

2.2.1. Research on Aadhaar

Aadhaar has been the subject of research across multiple disciplines since its inception. Research on Aadhaar has considered it a vehicle for inclusion and present specific exclusionary effects. What is clear from the review is that the mechanics of datafication and digital identity platform logics within

Aadhaar all have remained under-studied despite the widespread dissent it has attracted as a project of surveillance (Khera 2019).

Within research that report imperfect inclusion outcomes under Aadhaar, a subset of them call for a need to engage with surveillance as a socio-technological construct. For instance, consider the academic analyses which take a developmentalist view of technology in studying Aadhaar. These conclude that the programs' success shows mixed results and the technology itself is critically questioned, calling for further study on the sharper end of potential surveillance. An example can be seen in Bhatia & Bhaba (2017) calling for a contextual understanding of Aadhaar's use. They observe that the 'enthusiasm for the inclusion potential of Aadhaar seems to far outstrip any concerns about surveillance or threats to personal privacy' (Bhatia & Bhaba 2017, pg. 75). Similarly, Menon (2017) broadly present Aadhaar's 'digitisation' as means of inclusion of the marginalised but questioning the digital identity's fit for use in the specific case of food security system. The very nature of inclusion under Aadhaar itself remains contested as Menon (2017) call for a study of the surveillance dimensions of Aadhaar to understand any potential risk. These ideas have been echoed closely by Masiero & Das (2018) and Masiero (2015) in studying Aadhaar in food distribution and food security programs. They agree on an initial and mixed pro-poor success of Aadhaar's agenda of inclusion but mention this as having been achieved despite the surveillance potential as a clear negative aspect of the program.

A clear thread of exclusion resulting from failures of identification or allied processes is found in other studies of Aadhaar. This body of research calls for framing Aadhaar as a surveillance technology by considering adverse outcomes alongside the positive agenda of inclusion. For instance, Chaudhuri & Konig (2018) highlight an 'inclusion/exclusion paradigm' of Aadhaar, where the technology's intervention in social processes is seen to have exclusionary consequences. Similarly, Singh & Jackson (2017) portray instances of exclusion resulting from Aadhaar as a developmental tool. This is based on an analysis of one of the few pieces of research on Aadhaar that account for daily life experiences. The authors further suggest that impediment to the 'rights' of citizens arises due to the potential exclusion.

These narratives of inclusion based on Aadhaar largely stop from engaging with digital identity as a technology of surveillance, but do position the need to study the negative effect of surveillance as an outcome. This need for research on surveillance under Aadhaar mirrors the gap in academic understanding that Khera (2018) highlights. They highlight the need for a deeper sociological analysis placing surveillance and its impact at the centre engaging with the technical and policy aspects, alongside a much-needed study of citizens' everyday, ordinary, daily life experience in engaging with Aadhar. One exception that answers this call is the research done by Srinivasan et al. (2018) on understanding privacy related to marginalised individuals in India, but partly involving Aadhaar. They discuss that privacy has a 'relational' nature leading to a negotiated 'trade-off' - between harmful

effects of surveillance and the benefits of being visible when the marginalised want to interact with the state. Their study gives an appraisal of how surveillance is experienced in everyday life and hints as a need for deeper understanding of how data resulting from identification and linkage to transaction are used. Hosein & Whitley (2019) go further in their analysis, suggesting a relook at the combined narrative of Aadhaar as a technology of surveillance and inclusion.

There are wider research that studies the usage and implementation of Aadhaar solely as an effort in electronic governance. In this Bhat (2013) and Sivamalai (2013) suggest studying the varying stakeholder view of Aadhaar, highlighting competing narratives and objectives of the state and the citizens within the institutional environment of digital identity use. There are also studies in more positivist disciplines that take a perspective to increase the use of Aadhaar in techno-deterministic applications ranging from authenticating students taking tests (Dhanalakshmi et al. 2017) to voter verification (Patel et al. 2015). Such research remain critical within their own domains of seeking the implementation of Aadhaar. But the framing of these studies rarely addresses the impact of surveillance under digital identity. For this thesis, the volume of these techno-deterministic studies itself hints at an enthusiastic adoption of Aadhaar. It signals the spread of surveillance into multiple areas of digitally mediated life.

Perhaps most relevantly, research is needed with a juxtapositioning of surveillance and inclusion understood from a global South perspective. Arora (2016), who studies Aadhaar specifically as a technology for 'inclusive capitalism', states:

> …user behaviour and institutional practices of the Global North disproportionately represent and influence our understandings on this matter, which can serve as a genuine barrier to thoughtful, indigenous design of big data applications for emerging economies. (Arora 2016, pg. 1693).

Studies have also made a nascent exploration of datafication with respect to Aadhaar. This reading by Arora (2016) debates that Aadhaar is situated in the wider field of research on Big Data. They argue that datafication and the use of Big Data strategies are dealt with a bias of empowerment only when the narratives come from global South. In the global North, the same technologies of digital identity and Big Data projects evoke a "scepticism and caution on the social impact" they deliver. Heeding this disconnect Masiero & Das (2019) presents a conceptual need to engage with datafication instead of 'digitisation' in how Aadhaar has been designed and implemented as a clear theoretical gap. In most research on Aadhaar the focus has been to understand it as a monolithic identity system rather than its datafication properties. Authors have acknowledged this by suggesting Aadhaar as a relevant case study to understand the impact of datafication (Gurumurthy et al. 2016, Hickok et al. 2017).

Perhaps the most relevant work for this research is from Taylor (2017). They call for theorising intended benefits, mechanisms and controls related to visibilities resulting from surveillance using Aadhaar as an example. They present 'data justice' as a valuable and holistic analytical framing go beyond the seeming binary of harms & benefits to consider Aadhar as a complex platform. Ultimately, there is an evident need for research that studies inclusion as a benefit set against negative effects of digital platforms like surveillance, exclusion, a failure of inclusion, and related social harms like denial of rights and justice. Recent research by Masiero & Arvidsson (2021) and Masiero & Nicholson (2020) casts Aadhaar as a digital identity platform. They call for the centring of platform logics and architecture, such as openness and modularity, to understand Aadhaar's wider impact on its marginalised populations. They highlight that failures of inclusion, active exclusion and adverse monitoring of vulnerable individuals may be seen as results of platform architectural choices under Aadhaar (Masiero & Arvdisson 2021).

2.2.2. Research on Gig-work in India

There is a burgeoning body of literature on gig-economy platforms in India, this thesis' second area of focus. As a phenomenon, gig-work in India is very recent, and this is reflected in the limited related research output that considers datafication or a platform perspective. So, this review focuses on research to shed light on what current literature says about inclusion and surveillance within gig-work platforms in India.

Broadly, research on gig-work in India focuses on discussing the impact of digitally mediated work practices on the workers. Surie & Koduganti (2016) present an early insight into cab-haling platforms using research from the city of Bengaluru. They show evidence that Uber and Ola platforms in their initial phase were attractive to drivers and experienced a form of income security. In early years there is also a reported expectation that gig-work will lead to the formalisation of the urban workforce.

Later research on the impact of India's gig-work platforms shows a worsening of conditions. Kashyap & Bhatia (2018) show that financial impact is unequal among taxi-drivers and taxi-owners. They evidence that the promised economic benefit is not realised for those who work as drivers in cabs owned by others, thus presenting a cultural divide in the impact of platforms. Similar research by Prabhat et al. (2019) on uber drivers demonstrate that gig-work is considered a way to fill gaps in employment, with economic inclusion being a fundamental expectation for the drivers. In this paper, the authors challenge the global North assumptions about freelancing work used to frame gig-work by showing that blue-collar work like cab-driving suffers a more profound control exerted by platforms. Much as Kashyap & Bhatia (2018), Prabhat et al. (2019) present an intersectional view of gig-workers

with an interesting observation that lowered classes and castes are over-represented in the sector but fail to explore further the unequal socio-economic relations that this signals.

Cab-hailing platforms have a much larger focus among Indian empirical research. Mukerji & Roy (2019) presented a rare platform perspective and positioned it as an institutional transformation of what they term the 'organisational field' of cab-haling platforms. Their analysis showcases the complex connections of gig-work platforms with multiple stakeholders and entities. There is also a limited evidence of how data-sharing between platforms delivering digital payment and cab-hailing services impacts the livelihood of workers.

Other related literature focus on the informality of work and precarity of livelihood under gig-work. Aneja & Shridhar (2019) is a relevant work that calls out an asymmetry between workers and customers on platforms that mirror existing work conditions in informal work. From a labour practice perspective, they show that a precarious economic condition and connected uncertainty in the rhythm of working hours directly affect workers' well-being. This is seen to be performed by a spectrum of surveillance mechanisms that afford different controls to the gig-work platforms. Such an observation agrees with wider literature on gig-work that presents precarity as inevitable under platforms (Wood et al 2019).

Yet another subset of research showcase the experiences of cultural and gender differences in India's gig-economy. An 'intersectionality of class, caste, age and gender plays an important role in the worker's experience' as Ghosh (2021) claimed, who studies women gig-workers across food-delivery, cab-driving, and domestic-work platforms. They also observe a lack of trust in gig-workers and safety issues for women playing out in digitally mediated interactions between workers and customers. Gupta (2020) concludes with similar observations on gender, caste and class differences. Here again, an issue of trust is raised, but using an empirical study of gig-worker women working as beauticians and makeup artists. They present how algorithmic surveillance enacted through profiles and ratings of workers becomes a source of control and social categorisation among the workers.

Anjali Anwar et al. (2021) studies the experiences of gig-worker beauticians adding to the argument of surveillance and control within platforms. They argue that participation in gig-work pits existing socio-cultural logics against the surveillance visibility afforded within digital platforms. This is evidenced as resulting in multiple forms of surveillance – of algorithmic surveillance as control exerted by platforms , and as gendered, class and caste contextualised surveillance enabled within customer's interaction with workers. Interestingly, a third form of surveillance is presented of workers as women facing scrutiny from family, with the reasoning of ensuring safety. A similar argument is made by Parwez & Ranjan (2020) but framed by the changes faced among food delivery workers during the COVID-19 pandemic.

Another strand of literature questions the informality of gig-work and the unique role of formalisation given to platforms within the Indian context. Tandon & Rathi (2021) argue that domestic workers as intersectionally subordinated workers find inclusion into platform replicating some of the same inequalities as previous informal work. A similar narrative of gig-work as a formalising force is found in policy-oriented research. Randolph et al. (2019) cast the advent of gig-work platforms as a unique opportunity to regularise informal labour. They argue that platforms are a way to centralise economic and policy response by capitalising on the data generated within the platform ecosystem. Though this conflation of platformisation with formalisation is called out to be a false flag by Tandon & Rathi (2021).

Gurumuthry et al (2018) make a related recommendation as part of empirical observation of digital platforms in India. They present datafication as transforming both economic participation and affecting workers' rights within gig-work. They call for a fairer path to inclusion by reaffirming data rights of users within these platform contexts. This is reflected again by Kasliwal (2020), who calls for a 'platform of platforms' that establish procedural rules to deliver fair experience to workers who enter digital platforms.

The allied research on digital payment systems, especially the Aadhaar verified use of Unified Payment Interface (UPI) as integrated within gig-work platforms in India, presents the potentialities of financial inclusion. In this, Muralidhar et al. (2019) present the direct experience of auto-rickshaw drivers as gig-workers under Indian platforms, using digital payments. They highlight that a limitation to financial inclusion exists, as afforded by platform design features and algorithmic practices of pricing. These prioritise value creation for the platform rather than workers (or even customers). They advocate a wider understanding of 'autonomy' as being needed for workers in engaging with digital payments as a financially inclusive technology. As it exists, workers are under close surveillance and control of platform's practices, thus not attaining a full possible benefit of a fairly implemented payments technology. This is echoed by Joshi et al. (2019) who argue that financial inclusion under digital payment within a platform context must be as much about enabling 'bottom up' process performed at a user level even if it is influenced by platform design, policy and governance from above.

2.3. Conceptualising Digital Platforms

Stemming from the above broad review of relevant literature, this section synthesises and substantiates 4 perspectives of digital platforms to which this research contributes. These are presented as four related statements below.

- Perspective 1: Platforms as inhabiting a complex digital platform ecosystem.
- Perspective 2: Platforms and their ecosystem as agents of datafication across governmental and private contexts.
- Perspective 3: Platforms and their ecosystem as sites of paradoxical surveillance and inclusion.
- Perspective 4: Platforms as acquiring a distinct sociotechnological character in the global South.

Perspective 1 derives from a clear absence in the empirical framing of India's platform ecosystem and its impact on society. Existing literature such as Masiero & Arvidsson (2021) and Masiero & Nicholson (2020) casts Aadhaar as a digital identity platform, but does not extend their analysis to the wider ecosystems the digital identity inhabits and influences. An ecosystem view sits well with the call to examine digital platforms *in situ* to clarify their impact within studies of information systems and ICT4D (De Reuver et al. 2018, Koskinen et al. 2019, Heeks 2020, Bonina et al. 2021). Identifying various stakeholders and technical entities in the immediate ecosystems can add richness to the analysis of digital platforms.

The construct of datafication further complicates the view of the platform ecosystem, especially as digital identity by design are enablers of datafication. Datafication as a technological process behaves differently than identification in the global South sense. First, as discussed earlier, identification enabled the state to watch citizens, identify and possibly categorise them for its own needs. Emergent datafication, on the other hand, goes beyond to allow involvement of non-state actors. Datafication as an inherently advanced technological process is built on strong public-private synergies, as Lyon (2014) presented. Second, datafication further makes the proliferation of visibilities across a networked environment easier as data flows across and are sometimes available to many secondary state and non-state entities, often unknown to the data-subject. This evolved nature of surveillance creates asymmetries in power and result in ethical challenges which needs to be addressed. Lyon (2014) calls for research engagement with understanding the ethics of data-driven surveillance and contextualising power within such a setup, essentially casting the individual as a data-subject. This bring us logically to Perspective 2.

Datafication as a process in the global South has been linked to the involvement of private corporate technology actors. As Taylor & Broeders (2015) presents, there is a transformation in how governmental programs are set up. The state-citizen engagement becomes increasingly data-driven using aspects like data analytics with the citizen here being treated implicitly as a data-subjects. But as seen in the reviewed literature, digital identity platforms and gig-work platforms are seemingly treated

as non-intersecting entities. Whereas in reality, Aadhaar as a digital identity beings the journey of datafication for gig-workers. Similarly payments systems are involved with digital identity platforms and gig-work platforms. These as potential data-flows are largely not acknowledged by researchers who usually focus on one platform. In researching Aadhaar, both Perspective 1 and Perspective 2 are inter-related. Aadhaar as a governmental tool of surveillance overlaps with commercial gig-work platforms in how workers engage with them. By acknowledging this melding of the roles of citizen and data-subject, this thesis seeks to explore the experience of gig-workers as digital platforms users.

Perspective 2 is also related to the call for a critical understanding of datafication and the Big Data context, as has been repeated by multiple scholars in the last few years (Boyd & Crawford 2012, Gangadharan 2012, Lyon 2014, Van Dijck 2014, Zuboff 2015, Dalton et al. 2016). Specifically, regarding the role of data in the lives of the marginalised, Dalton et al. (2016) call for an ethnographic and thick description of situational contexts. Mainly this addresses a specific lapse in the theorisation of datafication within gig-work. Accounts of gig-work mainly address datafication as happening within the gig-work platform. These research do not address how data generated by gig-workers during their daily work and their datafied income processes become part of their data-driven futures within the platform ecosystem. This is an under-researched area within studies of platforms.

Yet another lacuna in research as given by Perspective 3 is in unpicking the paradoxical notion that platforms are both inclusive and extractive. The literature review presented can be framed by call for theorisation by Gangadharan (2017). They argue for an analysis of the complex interaction between inclusion and surveillance by referencing specifically that 'being included means participation in the potentially harmful consequences'. This indicates a need to widen the ambit of how aspects of surveillance are conceptualised. A similar argument is done Marwick & boyd (2018) who call for a theorisation that 'incorporates a wider set of harms and needs' of the marginalised to be understood in relation to their everyday practices. Prior analogous research by Taylor & Broeders (2015) has similarly called for theorisation and a new ethical approach in understanding surveillance and Big Data anchored in the global South. Quite relevant to this discussion is Gangadharan's (2012) work on understanding inclusion and surveillance as related concepts under the paradigm of Big Data, studying marginalisation within the USA. She suggests rejecting the overly positive 'utopian' tones of inclusion under datafication and seek to appropriate 'exclusion' too, in researching marginalisation contexts.

The other factor that scholars have highlighted as shown by Perspective 4 is the need for theorisation from the Global South view of datafication and Big Data strategies. As Rai (2012) and Arora (2016) argue, datafication and Big Data have been cast in the mould of uncontested 'pro-poor' language in Global South, including in the media and government. In cases related to marginalised populations especially, Big Data sees a lack of critical approaches to theorisation. While in the global North, similar discussions are moving towards ideas of data and privacy protection, these datafication

regimes in the margins of the global South occur in many countries in a vacuum of a national data-protection legal framework (Arora 2016). This paves way for a strong potential of data led discrimination and breach of ethics in using data. This has been acknowledged as an under researched arena in recent scholarship (Broeders et al. 2017, Roth & Luczak-Roesch 2018). Given the prevalence of a rights-based development of data-protection laws like the European General Data Protection Regulation (Roth & Luczak-Roesch 2018) these authors call for a similar focus in the global South.

A similar academic engagement with asymmetry of power within a datafication setup has been acknowledged by other authors. Couldry & Powell (2014) for instance argue that to understand the societal impact of Big Data, 'voices' of all stakeholders are to be heard in making the analysis. They suggest that the power and its asymmetry must be understood by engaging with practices of how the powerless grapple with data and how datafication can advantage the powerful. This shines a light on the need to understand daily experiences of data centring the position of marginalised within processes of datafication. Kennedy & Hill (2018) echoed this argument, with a call to contextualise 'everyday engagement' with digital technologies and to critically understand datafication's context.

2.4. Conclusion

The literature review presented in this chapter identified four perspectives on digital platforms that need to be explored further. First, platforms are seen necessarily as sites of datafication and surveillance, borne out in multiple ways. The state performs surveillance through its digital capabilities alongside monitoring, data-extraction and control experienced under commercial digital platforms. Secondly, platforms are also considered a necessary route to developmental benefits. Many platforms are involved with financial inclusion, generation of employment or bettering income opportunities. While the first perspective is primarily considered in the global North, the presence of digital platforms in the global South, rather optimistically, attracts the second perspective. This disconnect is evident also in the Indian empirical context. Research on Aadhaar or gig-work platforms does not reconcile surveillance as a negative construct and inclusion through digital platforms as a beneficial necessity for the marginalised populations. So, the task at hand for this thesis is to conceptualise surveillance, its connection to datafication within digital platforms and then query how inclusion is performed within this construct. The next chapter argues for a lens of social justice, presents its connection to surveillance to make sense of the seemingly opposing roles played by digital platforms.

3. THEORETICAL FOUNDATION

The previous chapter detailed the varying perspectives on digital platforms that need to be addressed in this research. These included apparent contradictory impacts of a sharp end of surveillance and a beneficial outcome of inclusion within digital platforms. This chapter forefronts 'data justice' as a starting point, considering the seeming paradox of surveillance and inclusion. The first section presents and justifies using a data justice perspective that binds surveillance, datafication and social justice concepts together. The second section seeks an understanding of surveillance by initially engaging with a working definition of surveillance, then presents significant theories of surveillance relevant to the research. Following this, the concept of 'liquid surveillance' is introduced, which helps understand how digital identity and gig-work platforms can be conceptualised, how datafication is enacted, and to discuss their social implications. The third section of this chapter conceptualises inclusion through social justice lens – specifically 'abnormal justice' and discusses its relevance to surveillance. The final part of the chapter presents an overview of the theoretical foundations and the specific analytical categories made available for research.

3.1. A Data Justice Perspective

Surveillance largely attracts concerns of negative consequences such as disadvantage and discrimination faced by the marginalised. Multiple authors have discussed surveillance also under the spectre of growing datafication as an ethical and a rights issue (boyd & Crawford 2012, Lyon 2014). Perhaps most relevantly, the overarching construct of 'justice' captures these complex situations of disadvantage and theorises the process by which these disadvantages can be overcome - for and by the marginalised. The idea of 'data justice' as an emerging field of work studying the impacts of datafication provides an appropriate means to connect it to theory.

Justice in this perspective is intimately connected to surveillance. Here, injustice is personal when surveillance can lead to a potential negative consequence, as Newman (2015) presents. It starts with individuals being surveilled at work, by the state and further by institutions like banks. But with data accumulation and categorisation – especially under the Big Data paradigm, multiple platforms collect data increasing the scope and range of surveillance. The mode of surveillance is then the categorisation of the surveilled individuals. Under data justice, impacts of relevant surveillance processes such as algorithmic profiling, biometric identification, commercial data-driven targeting and other data misuse are all considered to understand their social implications.

Three interpretations of data-justice have been given by Johnson (2014), Heeks & Renken (2018) and Dencik et al. (2016). Johnson (2014) has presented data justice as 'information justice' by

analysis surrounding the concept of 'open data'. He argues broadly on the position of data in governance as disciplinary power and that it's a disciplinary surveillance system that seeks open data as a means of enforcement. Individuals and institutions who go beyond the norm can be castigated by reading into their open data and by forcing the publication of such data. They self-discipline themselves in response to this judgement of the powerful state and thereby establish a pattern for justice and injustices within the society.

Related to this, data justice has been discussed further by Heeks & Renken (2018) . They present justice under three perspectives derived from mainstream theories of social justice

- Instrumental data justice – which presents justice as means of fairness in use given the instrumental value of data. Here the main focus is on the justifiable use of the data and the outcomes of the use must not cause injustice. Here they fall back on Johnson's (2016) further work on 'information justice'.
- Procedural data justice – this provides justice as fairness in the procedures and processes of handling data and by extension the decision and actions resulting from it, including both human and technology-based elements.
- Distributive data justice – built on the fair distribution of data where justice is conceptualised from the 'rights-based approach' (Cornwall & Nyamu-Musembi 2004). They go on to define right of data access, ownership and representation/inclusion.

Dencik et al. (2016) on the other hand squarely place data justice in relation to 'surveillance capitalism' (Zuboff 2015) and datafication as a feature of it. They present justice here as a social justice and social activism paradigm of anti-surveillance activities. Their reading of justice is framed as an issue of rights and engagement with the technology inherent to surveillance. Ultimately, they call for a 'collective movement to engage in pertinent data-related debates' (Dencik et al. 2016, pg. 10) as means to achieve justice.

Further work on data-justice has been done by Taylor (2017) in reconciling multiple aspects of the above three theorisation. In understanding the various ideas within data justice across the three models described above, Taylor presents a need for an overall framework.

> A framework is necessary, then, that can take into account the need to be represented but also the possibility of the need to opt out of data collection or processing, the need to preserve one's autonomy with regard to data-producing technologies and the need to be protected from and to challenge data-driven discrimination. (Taylor 2017, pg. 8).

The three 'pillars' of such a framework as proposed are 'visibility, digital (dis)engagement and countering data-driven discrimination'.

Data justice as a concept understood from the series of literature above presents some engaging points for conceptualising surveillance and its dynamic relationship with inclusion. Mainly as both Johnson (2014) and Dencik et al. (2016) present outright (Heeks & Renken 2018 allude to it), surveillance is placed squarely in theorising the justice paradigm. More usefully, Taylor (2017) has extended this to include the concept of 'visibilities' to understand surveillance under a data justice perspective. The work of Gangadharan (2012, 2017) also suggests the need to invoke 'social justice' understand inclusion predicated on digital technology and the 'complexity of what participation and incorporation into online worlds entail'.

A construct of marginalisation and inclusion is thus appropriate to social justice. As Perlgut (2011) explicitly observes, understanding inclusion and exclusion under digital technologies 'may become the major social justice challenge of our time'. This has been acknowledged in understanding broad notions of inclusion or exclusion in the light of digital technology. For instance, Eubanks (2011, 2014) considered a top-down techno- or digital solutionist view of inclusion intimately connected with social justice. Much like Gangadharan (2012, 2017) other authors also call for considering inclusion squarely within a framework of justice in relation to technological interventions and their impacts (Coleman 2008, Perlgut 2011). Further calls exist to understand everyday routines through which individuals engage with the digital nature of inclusion and its social impacts (Helsper 2017).

The overarching argument of relating inclusive outcomes using digital technology is favoured by authors writing on data justice, even if they do not define inclusion directly under a justice viewpoint (Taylor 2017, Heeks & Renken 2018). This can be seen where research using a data justice lens subsuming aspects of marginalisation before inclusion and discrimination after surveillance, both as aspects of justice. This hints that while surveillance can be potentially oppressive, the resulting visibilities of the individuals to the state and non-state actors are necessary to deliver inclusion. Agenda of these technologies presented as inclusion or even as positive effect for the marginalised population is acknowledged to have certain negative consequences. The negative impact here could be either by absence of inclusion or adverse outcomes due to the discriminatory nature of technologies, or unfair exploitation of the data generated by users. Similar points are reflected in works which cast datafication as an issue of justice (Dencik et al. 2016, Taylor 2017, Heeks & Ranken 2018). A subset of such texts deems that the role of surveillance requires to be understood in detail under a social justice framing (Taylor 2017, Cinnamon 2017). A summary of these many viewpoints can be found in Gangadharan's (2012) call to acknowledge in both practice and research that:

> …systematic uses of new technologies will create social exclusion as much as promote equality and social justice… [and confront] the complexity of what digital inclusion means in ways that anticipate when and where surveillance may interfere with meaningful involvement in digitally mediated worlds. (Gangadharan 2012, no pagination).

Heeding this as a gap in research, this thesis seeks to approach inclusion and its relation to surveillance and technologies of datafication using an overarching lens of social justice. The following sections of this chapter pick up this point by reviewing relevant theories to arrive at a set of analytical categories as can be applied to research.

3.2. Understanding Datafication and Surveillance

Surveillance is broadly understood in terms of 'visibility', both as a social and technical analytic (Lyon 2016). The construct of visibility here stands for gathering knowledge about certain groups of individuals by those who undertake surveillance (Brighenti 2010). Surveillance in academic and popular discourse are often presented as acts of 'observing' or 'watching' or some variation of the same. For instance, academics have most often modelled state surveillance as an oppressive 'Big Brother' watching overs the citizens (Caluya 2010). The impact of this visibility need not be only oppressive on those being surveilled. Visibility of citizens to the state through governmental surveillance is deemed necessary for the efficient provision of benefits. In the absence of this, the marginalised population can fall under a 'surveillance gap' resulting in 'systemic invisibility' of certain classes within the society (Gilman & Green 2018). Surveillance in society then has to balance mitigating harms from oppressive exposure while increasing the effects of inclusive visibility.

Zuboff (2019), in discussing 'surveillance capitalism', presents an instructive idea that contextualises visibility in contemporary surveillance. She claims that the core instrumentation of surveillance in digital platforms results in 'unprecedented asymmetries of knowledge and power'. Both 'knowledge' or the act of knowing, and the resultant 'power' are theorised as key concepts of surveillance. Power emanates from the asymmetry of social relationships, between those subject to surveillance and those who seek knowledge about these subjects (Brighenti 2010).

The recent academic thought on datafication adds to this surveillance construct in how power and knowledge are reconstituted. The function of datafication is breaking down information related to processes and people many times as acontextual pieces of data (Mayer-Schoenberger & Cukier 2013). This data is structured for analysis and interpreted as an act of data-driven surveillance by those who seek knowledge of the surveilled subjects (Andrejevic 2014). Concerns about surveillance are only intensified under such datafication, particularly under Big Data (Lyon 2014). Van Dijck (2014) argues that with Big Data surveillance power is also wielded by private players as public-private synergies are

routinely needed to capture, store and analyse humongous amounts of data. This shift into datafication is marked by, in the words of Lyon (2014), 'an increased integration of government and commercial surveillance', signalling a more complex model of visibilities

Ultimately, the analytical use of visibility becomes a stand-in for power and knowledge. Visibility has been often used to understand the complex relationship of surveillance among citizens, consumers, the state, and the market. The ability that datafication brings in performing multiple visibilities forms the crux of how surveillance is understood in this thesis. The rest of this section engages with relevant theories where surveillance is understood as performed through visibilities and by positioning datafication as a construct within the discussion.

3.2.1. The Panopticon

Surveillance, understood as 'hierarchical' visibility, is used to explain citizens' surveillance by the state (Marx 2015). This view of surveillance attracts the 'panopticon' as the dominant metaphor used in academic research. The panopticon is Jeremy Bentham's architecture of a metaphorical prison with prisoners being monitored by an unseen guard but having clear visibility of the entire set of prisoners. The name derived from Greek roots of 'pan' meaning 'all' and 'opticon' to signify 'visibility', Bentham portrays ever-present visibility of a powerful watcher over the watched (see Bentham 1791 for original text). Panopticon's design makes the visibility of the prisoners to the guard a constant. Visibility is also maximised through a planned arrangement of the prison structure. The watched are reduced to behave as if they are under scrutiny always by an unseen watcher. The visibility of the prisoners to the watcher is essentially unverifiable. This is cast as the panopticon's disciplinary power, forcing those who are surveilled to self-discipline and become docile (Caluya 2010).

Panopticon became possibly the significant modelling of surveillance, with the most influential interpretation given by Michel Foucault in *Discipline and Punish* (Foucault 1977). Foucault presented panopticon as working :

> …to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power (Foucault 1977, pg. 201).

In the panoptic view of society, surveillant scrutiny is placed on the undesirable population and disciplinary power is wielded on them. Foucault saw a change in the social order under a 'panoptic schema' (Foucault 1977) where the fear of an over-seeing authority like the state stirs self-discipline among the citizens.

Disciplinary power illustrated using the prison metaphor, was used to study other institutions like armed forces, hospitals, factories and schools, and extended to wherever bounded governance is still

applicable (Ignatieff 1981). Consequently, within information systems research, the panoptic framing of surveillance was of interest to study contained organisational forms. This can be seen within research on early enterprise computing and other aspects of technology infrastructures (Bloomfield & Vurdubakis 1997, Kayas et al 2008). In a similar vein, governmental programs, like welfare surveillance that necessitated the 'knowing' of the poor with 'overseeing' mechanisms, were naturally interpreted with a panoptic framing (Gilliom 2001). Essentially for the government to act on the poor's life situation the state 'sees' the poor, categorises them into 'observable' groups and ultimately decides on a governmental mechanism to include them in society and economy (Scott 1998).

Panopticon as a model for power tends to appear in academic analysis, in many cases merely to signify a rather simplified view of a 'top down' surveillance or of disciplinary power of being under supervision. This simplification surfaces mainly in literature as multiple interpretations of the panopticon qualified with a descriptive word in front of it. So, electronic panopticon, digital panopticon and biometric panopticon all existed with varying levels of analytical use. An example of this panoptic metaphor was Breckenridge (2008) framing the South African national identification system as a biometric panopticon.

The prison's metaphorical bounded nature is the limitation of the panoptic framing of surveillance when applied to a highly networked digital era. Foucault's analysis casts a stylized view of society where disciplinary power is performed as a carceral measure. This escapes confronting the idea that surveillance, especially in the datafied era, is expected to follow those who are surveilled even if they are mobile. The earlier example of Breckenridge's (2008) conclusion on the biometric panopticon shows the dissonance between mobility and panopticons carceral construct of surveillance. Breckenridge (2008) argues that biometric identification cannot be 'pan' in its surveillance as it cannot allow movements of citizens across different parts of the society while continuing to monitor them. Any non-carceral existence of individuals challenges the analytical use of the panopticon (Wood 2016). Foucault did not consider newer technologies, especially observed in consumer surveillance context where the surveillance subjects are not confined but allowed mobility to take part in within the market.

The widely acknowledged critique of the panopticon is the need to look beyond a rigid 'top down' view of surveillance (Boyne 2000, Wood 2016). Advancing technological capabilities of datafication and networked technologies have introduced newer forms of surveillance. Docile subjects and one-way visibility go against technologies like mobile or social media platforms used by 'active participants in constant interactions and communication flows' (Leclercq-Vandelannoitte et al 2014). Such active participation means that the intended 'docility' is not easily achieved by mere panoptic disciplinary action in all surveillance situations (Lyon 2016). In the panoptic characterisation, surveillance is only

intended to know information about the person. They are not part of the chain of communication as the surveillance setup does not necessarily interact with the person and merely oversees. This is at odds with the nature of contemporary communication technologies, especially digital platforms where users themselves as creators of content are actively involved as subjects of communication.

3.2.2. Post-panoptic Surveillance

While the panopticon is modelled as a bounded surveillance mechanism, advancements in information technology brought in newer capabilities. Surveillance, as monitoring and tracking, worked even when affording mobility to a digital network's users (Gane 2012). It was necessary to understand a 'post-panoptic' surveillant visibility that can 'control' in an unbounded technological environment (Boyne 2000). A post-panoptic understanding of surveillance enabled by datafication is of theoretical interest to this thesis.

An influential theorisation by Haggerty & Ericson (2000) presents such a framework of 'surveillant assemblages'. An 'assemblage' comprises heterogeneous elements, both tangible and intangible, coming together functionally as a composite entity. In this case, they are information systems elements of processes, technology, data, artefacts and people that enact surveillance (Bogard 2006). This signals the move from a monolithic view of one powerful entity conducting surveillance to distributed surveillance capabilities across an ecosystem. Under this metaphor, the elements of the assemblage are considered to be cast into a series of discrete 'flows', which capture the movements or changes of the elements. Post-panoptic surveillance is interested in controlling these flows, and thus, disciplinary surveillance in the panopticon is replaced with control (Haggerty & Ericson 2000, Wood 2016). This version of control allows for 'mobile ' and 'nomadic' users and across 'public and private, work and leisure, production and consumption (Yar 2003, pg. 257), reflecting closer the nature of datafied surveillance.

Haggerty & Ericson (2000) conceptualise the performance of control through a 'rhizomatic levelling' of surveillance. Data networks, in this view, are like rhizome roots sending up shoots from many places instead of a single powerful hierarchical structure of surveillance. The use of 'levelling' is to mean that surveillance is more egalitarian across the network, and previously exempt groups also end up facing surveillance as it becomes more pervasive (Wood 2016). This presents a conceptual conundrum. The idea of level+ling provides a strong explanatory potential for contemporary surveillance, but it also ostensibly democratises hierarchies inherent to surveillance as a social issue. Not everyone in a digital network faces the same kind or level of surveillance. Hier (2003) probes for an answer to this and provides the explanation that the assemblage polarizes surveillance resulting in 'the simultaneous levelling and solidification of hierarchies '. This acknowledgement of the partial

levelling and the play of a hierarchical surveillance power is essential for this thesis in studying the experience of marginalised people undergoing unequal impacts of surveillance.

Haggerty & Ericson (2000) further address the issue of data. They construct surveillance as being acted on decorporeal 'data-doubles'. Surveillance's move beyond the direct visibility of panopticon and being enabled by data has been termed 'dataveillance' (van Djick 2014). The performance of surveillant visibility is over this data-double. Or as Haggerty & Ericson (2000) term it the data-double becomes:

> …a visualizing device that brings into the visual register a host of heretofore opaque flows… [and is] productive of a new type of individual, one comprised of pure information… (Haggerty & Ericson 2000, pg. 611).

The surveillance of the data-double though, does have tangible effects. As Hier (2003) put it, data-driven surveillance:

> … can be understood as a mechanism of 'visualization', giving rise to a cyborg flesh/technology amalgamation comprised of pure information which is only then redirected back towards the body for a multitude of reasons. (Hier 2003, pg. 402).

This enables the reification of data-driven surveillance dependent on the individual's interaction with the technological setup. The resultant control is re-corporealized into impacting the individual.

Thus, datafication helps perform a diffused surveillance, with multiple watchers across the network, and it also makes visible selectively what was once opaque to both platforms and its users (Hansen & Flyverbom 2015, Ganesh 2016).

Surveillance is then squarely placed in the realm of Big Data. Data-double becomes here an useful analytic to understand 'platform surveillance' dependent on the datafication of 'social practices and relations' , and how this impacts the users of these platforms (Wood & Monahan 2019). The interactions users undertake within platforms also become part of their data profiles (Galič et al 2017). There is a mutuality of such visibilities between the watcher and the watched, especially as presented by Adams (2013) through user-generated content like rating and reviews, all becoming part of the data-double. These data-doubles are composed of the many traces of data that are collected across the network as a profile (Leclercq-Vandelannoitte & Aroles 2020), tying datafication and surveillance inextricably together.

In information systems literature post-panoptic framing has been invoked to understand surveillance both at organisational and platform level of analysis. For instance, this is invoked by Kerr et al. (2014) in studying 'massive multiplayer online games' where human elements like demographic

details and behavioural details and equally nonhuman elements such as online transactions and financial data of purchases as a result of datafication have been subsumed in analysis. Rooney (2012) suggests a similar approach by contextualising children's engagement with internet-based communication systems using the post-panoptic theorisation to highlight the visibilities of the children to each other and to parental authorities. Recent research on gig-work platforms such as Uber and Deliveroo, cast surveillance within these platforms as a post-panoptic assemblage (Jamil 2020, Woodcock 2020).

This post-panoptic turn presented is instructive in co-positioning datafication and surveillance. The next section acknowledges this theorisation and explores 'liquid surveillance' to synthesise 'inclusion' as a product of surveillant visibility.

3.2.3. Visibilities of Liquid Surveillance

David Lyon (2010) extends further the post-panoptic framing of surveillance as being 'liquid' – terming it 'liquid surveillance'. This construct of surveillance is rooted in readings of Zygmunt Bauman's (2000, 2013) thesis of 'liquid modernity'. A liquid modern understanding of society considers contemporary notions of modernisation to have transitioned from the 'solidity' that aimed at building stable institutions, creating structures and permanence, to what Bauman terms as 'liquid modernity'.

Society is in constant flux, of being 'liquefied' from its solid roots of stability, structure, and bounded bureaucracies. In this way, liquidity captures the conditions of constant social and technological change within many digital contexts, offering specific ways to conceptualise platform ecosystems. Below is a reading of the different constructs in liquid surveillance relating datafication and inclusion to it. For this thesis, liquidity of surveillance as presented (Lyon 2010, Bauman & Lyon 2013) conceptualises technologies essential to identification, networks and flow of data inherent to datafication. Further, readings of liquid modernity connect surveillance to work, consumption, welfare, citizenship, and belonging in contemporary society (Bauman, 2000, Abrahamson 2004).

Liquid modern society, in a nutshell, is one that has become more competitive, commercially focussed and has a never-ending pursuit of improvement. Lyon (2010) and Bauman's (Bauman & Lyon 2013) ideation of liquid surveillance subsume data-driven surveillant visibility set within a digital society. 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, pg. 325).

This offers the possibility to study the rapidly evolving technologies of platforms, the performance of datafication practices, and even their contexts as a mutable subject (Bauman, 2000), especially affecting how power and visibility are experienced under liquid surveillance. Bauman & Lyon (2013) cast power under liquid modernity as post-panoptical riding on deep and wide data-driven surveillance:

> [In] the post-panoptical world of liquid modernity much of the personal information vacuumed so vigorously by organizations is actually made available by people using their cellphones, shopping in malls, travelling on vacation, being entertained or surfing the internet. We swipe our cards, repeat our postcodes and show our ID routinely, automatically, willingly. (Bauman & Lyon 2013, pg. 17)

Thereby liquid surveillance becomes:

> …flexible, mobile, seeping and spreading into many areas of life where once it had only marginal sway. (Bauman and Lyon 2013, pg.2).

Liquidity thus understood within Bauman's corpus of work provides key analytical facets of surveillance cast as a mode of visibility (see table 3.1 below).

Facets of Liquid Surveillance and their explanation
Banopticon: Security apparatus that keep undesirable population out and allow desirable population.   Power is of providing inclusion or being left excluded.
Synopticon: Marketing apparatus that attracts only the desirable population.   Power is of seduction to coax individuals into desirable behaviour.
Data-double: Result of profiling apparatus allowing extraction of data about individuals from various contexts and it's aggregation as a databased profile.

Table 3.1: Concepts in 'Liquid Surveillance'
- as presented by Bauman & Lyon (2013)

These concepts are explained further and used below to conceptualise surveillance within digital platforms. This scholarship also subsumes earlier theorisations of surveillance visibilities, which helps define the surveillant construct of inclusion, as shown in the following sections.

3.2.3.1. Banopticon and Inclusion

Bauman & Lyon (2013) portray liquid surveillance as a complex phenomenon where surveillance serves two opposing objectives in society: confinement (or 'fencing in') and exclusion (or 'fencing out'). This is derived from an interpretation of a 'banopticon' as Didier Bigo (2006) presents as a security apparatus. Here the 'ban' defines a notional border that excludes the unwanted and includes the wanted, along with 'opticon' standing for visibility. Bauman's use of banopticon in the spectrum of surveillance theorisation is crucial in understanding surveillant inclusion in contemporary society.

As a metaphor, banopticon inverts the enclosed disciplining nature of the panopticon and considers modern surveillance like identity cards and biometric identity (Lyon 2009) as being one in which:

> ...the technologies of surveillance sort out who needs to be under surveillance and who is free of surveillance, because of his profile. (Bigo 2002, pg. 82).

So, as an inverse of the panopticon, those who are under confinement are not the undesirables, but they are the desirable ones achieving 'inclusion' and allowed entry. The banopticon is a gateway to inclusion for those who are deemed worthy to enter and participate in the digitally mediated society.

The banopticon comprises three elements making up the surveillance mechanisms presented by Bigo (2014). First is the exceptionalism of power - by which rules brought about to define a condition of exceptional control of the population is presented by the politics surrounding the need for a banoptic gatekeeping (Ajana 2012). For instance, the increase of security screening and surveillance in international travel in the post 9/11 era of surveillance has been considered a banoptic surveillance with airports as the arena of exceptional rule and a political normalisation of constant high alert situation (Nagy 2016). Specifically, in the case of biometric technologies, a need for bio-political identification provided is presented as an exceptional 'case for necessity' (Ajana 2013). This chimes well with the erosion of the exceptional nature of biometric technology being a surveillance tool and now becoming a minimum requirement for inclusion and exclusion, in case of citizen interaction with the state.

This exceptional rule manifests itself as a notional border of practices, rules, and processes that separate the included and excluded groups, which becomes a permanent norm of society (Bigo 2002). These present the policies which become the means by which inclusion and exclusion is socio-politically defined and presented. The concept of banopticon is also of interest as it has been instrumental in engaging with a variety of surveillance practices, especially with both notional border as described above and real borders in cases of marginalisation due to international and national mobilities. This encompasses the understanding of marginality of citizenship claims, refugees or

asylum seekers under securitisation of the state and equally a marginality due to urban or national contestations (Benam 2011, Maestri & Hughers 2017, Nagy 2016, Woodling 2009).

The second element of the banopticon is the profiling and exclusion of certain categories of individuals based on a potential for future undesirable behaviour undertaken under the visibility provided through identification. This plays on the notion of 'categorical suspicion' (Marx 1988) – a blanket suspicion of a category of people as being 'socially perceived dangerous groups' and the profiling of individuals from such a group (Hier 2003). The banopticon is involved in analysing the surveilled individual's past behaviour to assuage this suspicion. This act of crossing the banoptic barrier of suspicion and being determined as qualified to participate within the wider society becomes the critical challenge for those marginalised and seeking inclusion.

In a digital platform, it's the result of datafication which present opportunities for this categorical profiling and possible discrimination. In the absence of data protection and code for ethical practices, these datafication processes 'act as gatekeepers' to entitlements, which can raise discriminatory practices even when inclusion is being aimed for or achieved (Nagy 2016). Coercive surveillance power can still apply to those who fail to qualify and cross the banoptic border.

Third, under the banopticon a normalisation of the desirable non-excluded categories is undertaken. Individuals continue their lives on the included side of the 'ban' by creating a 'normal' narrative for these desirable groups (Bigo 2014). Normalisation is the flip side of the same exceptionalism defined by the banopticon. As Ajana (2013) notes the definition of the 'ban' is on the basis of an exceptional rule but its presentation to the surveilled population justify the need for exceptionalism through politics of normalisation.

The normalisation is also a function of the ban in the banopticon not equally affecting all of the surveilled individuals (Sharma 2009). The meaning of the ban, the rules, and its expansion into daily life is a complex multi-layered and datafied phenomenon, affecting various sections of the population differently and resulting in different meanings of exclusion (Ajana 2013, 2020). Those excluded because of the ban can face more scrutiny by surveillance of the panoptic kind. Accessing identification promises an opportunity for 'enhanced visibility'. This is normalised and even made attractive to those marginalised by their fellow citizens and the state due to their lack of being 'seen' (Bauman & Lyon 2013). For example, in the case of contestation of belonging at a national border, the exclusion actually leads to 'camps' of failed asylum seekers who undergo severe levels of scrutiny (Maestri & Hughers 2017). But those who enter into the 'system' as successful asylees have a different and positive enhanced visibility where documents and database can showcase their inclusion. A

similar case of banoptic exclusion and visibility is discussed as resulting in 'ghettoization' of Roma people in Europe by Nagy (2017).

Thus, the banopticon enables the inclusion of the desired group and collect information and potential removal of aberration and undesirables as quickly as possible (Boyne 2000). Boyne further notes about inclusion as a function of surveillance with the 'ban' in action:

> The prime function of surveillance in the contemporary era is border control. We do not care who is out there or what they are doing. We want to see only those who are entitled to enter. (Boyne 2000, pg. 287).

The normalisation efforts around the banopticon routinises its own need manifesting surveillance in the daily lives of the surveilled individuals. As Bigo states about the banopticon:

> Surveillance technologies, as well as attitudes towards constant monitoring of activities, have shifted and greatly expanded to become routines of everyday life, rather than exceptional practices. (Bigo 2006, pg.46).

Thereby, the ban protects the normalised existence of both those included as the preferred groups and the excluded as the unwanted ones. Without the individual seeking surveillance and allowing the datafication of their lives, work, past and current behaviours, and gauging the risk of their future non-compliance, inclusion cannot be achieved.

To be included in this complex web of visibilities, one needs to be inside the border set by the banopticon. It becomes the individual's responsibility – a Do It Yourself (DIY) job of self-surveillance, through a politics of normalisation as individual's duty, if they seek inclusion. As Bauman further puts it about seeking visibility through the banopticon:

> The gear for the assembly of DIY, mobile and portable, single- person mini-panopticons is of course commercially supplied. It is the would-be inmates who bear responsibility for choosing and purchasing the gear, assembling it and putting it into operation. (Bauman & Lyon 2013, pg. 73).

The post-panopticism of visibility under liquid surveillance does not need the watcher being near the surveilled individuals. In fact, to maintain a 'bounded, structured, stable' means of visibility is cumbersome (Bauman & Lyon 2013).

> What mattered in Panopticon was that the people in charge were assumed always to 'be there', nearby, in the controlling tower. What matters in post-Panoptical power-relations is that the people operating the levers of power on which the fate of the less volatile partners in the relationship depends can at any moment escape beyond reach -into sheer inaccessibility. (Bauman 2000, pg. 11).

Power is derived not by uncertainty of not knowing if you are being watched as in the panoptic condition. Power is consequently derived from the fear of the surveilled individual being caught in the wrong place of not being seen when it is needed (Bauman & Lyon 2013). But an asymmetry in visibility still exists as the watcher does not need to be nearby. Visibilities are automated and datafied with watchers across the network. The powerful watchers themselves can choose to be invisible, slip back, and escape at a moment's notice (Lyon 2010).

As each of Bauman's 'mini-panopticons' exists in a network of social and technological visibilities, the individual opts in or *has to* opt in to create an individualised identity and build their own means of surveillant visibility. This self-surveillance pushes for a post-panoptic visibility of control, where an unbounded visibility enables mobility of the surveilled individual and so extends surveillance throughout their daily life experience (Haggerty 2006, Galič et al 2017). Surveillance constantly follows as the mini-panopticon is in the form of technological artefacts like mobile phones, codes and passwords, digital identities and online profiles enabling mobility within the network (Bauman & Lyon 2013). All of this works to accumulate data as living under surveillance continues building up the individual's profile as they continue to interact with the network (Charitsis 2016).

3.2.3.2. Synopticon and Seduction

Within liquid surveillance, visibility is further characterised as being 'synoptic' (Bauman & Lyon 2013, Lyon 2019). Based on Bauman's (2000) reading of Thomas Mathiesen (1997), elements of synoptic surveillance act as a parallel and reciprocal system of control alongside its panoptic counterpart. The synopticon here is a marketing apparatus aimed at a watching audience. So, synopticon is an idea of visibility ('opticon') from below ('syn'), that Mathiesen (1997) postulated as 'many watching the few' and has evolved alongside panopticism as Foucault presented, with opposing visibilities but in 'intimate interaction with each other'.

Mathiesen (1997) originally bases his view of synoptic visibility on the study of 'mass media' - mainly television, as it applied before the prevalence of the internet and online interaction. Mathiesen centres his argument on the early limited connected services to term it a 'one-way medium' with minimal interactivity even when mentioning the internet. So, his construct of synopticon is decidedly one that can 'broadcast' the visibilities and the messages of those few who are powerful to the many who are watchers.

Thus the synopticon reverses the panoptic conceptualisations as the powerful entity enacts its own visibility (becoming the watched) to the multiple watchers. Relevantly for the era of digital platforms, Bauman & Lyon (2013) recast the synoptic performance as the role of marketing in attracting the most desirable to engage with the banopticon, and so get included. On the other hand,

the state employs synopticon to normalise the exceptional power of the government to deploy surveillance (Bauman & Lyon 2013).

The surveillant power is also recast in the synoptic interpretation. It take a form of seduction of the desirable subjects of surveillance:

> One would expect a decline in the use of negative forms of panoptical surveillance power over, and a shift to more positive regimes of power to. Liquidly modern organization can be expected to become less normalized, less hierarchical and less tightly governed by surveillance and to display more signs of synoptical power to supplement panoptical power. (Clegg & Baumeler 2010, pg. 15).

The 'positive regimes of power' in the synopticon is enticement and seduction to participate in the visibility regime, replacing the panoptic disciplinary power (Lyon 2019). Power here results from the simulation through datafication and profiling of those under categorical suspicion (Hier 2003), and through consumerist categorical seduction (Bogard 1996, Bauman, 2000). Individuals are reduced to their data and digital representations by attracting them to voluntarily submit to datafication. Those seeking inclusion from a position of marginalisation do not need to be seduced. They seek out this datafication. But those who already are in a desirable position to be included still need to be datafied, and thus enticed into the network of visibilities.

Very relevantly to digital platforms' power is a mere 'nudge' and not punitive disciplining (Bauman & Lyon 2013). Oppressive power expected of state surveillance over the citizens is replaced by what Bauman presents in earlier work as power:

> …by seduction. Who rules the (air)waves, rules the lived world, decides its shape and contents. (Bauman 2000, pg. 155).

As a consequence of such synoptic seductive visibility, the surveilled individual as a citizen or a consumer is lulled into handing over data required, in an implicit assumption that the information collected is being used for their benefit (Lyon 2019). This datafication makes them susceptible to multiple watchers. Individuals need to participate is cultivated actively by the platforms, and they give in to the consumerist seduction :

> Our market-deployed surveillance assumes that manipulation of choice (through seduction, not coercion) is the surest way to clear the offers through demand. The willing, nay enthusiastic, cooperation of the manipulated is the paramount resource deployed by the synopticons of consumer markets. (Bauman & Lyon 2013, pg. 114).

Synopticon and its visibilities here are of multiple kinds. Public relations techniques of both government and its partners lend credence to the surveillance. The celebrity spokespersons and

politicians help spread the message (Mathiesen 1997). Also, traditional and social media increasingly play a crucial part in reinforcing messages. In digital platforms, this synoptic power is seen to gamify and nudge its users showing rewards and ratings that are attractive (Törnberg & Uitermark 2020). Even if the handing over of data occurs voluntarily, there is a guise of convenience attached. Individuals are marketed conveniences of swiftness and instantaneity, but only if personal data is submitted for an individualised and customised experience. This, in its essence, is the main consumer expectation from a technology-mediated transaction, forming an epiphenomenon termed the 'tyranny of convenience' (Andrejevic 2007, Pridmore & Lyon 2011). This pursuit of convenience can extend to the point of being a manipulation under the practices of digital platform surveillance (Darmody & Zwick 2020)

Bauman argues that thus seduction accompanies an irrationality of the consumer in accepting the 'predicament' of a growing need for digital participation, especially as refusing to participate is not a real choice (Abrahamson, 2004). This notion of irrationality finds a place in information systems research into the concept of 'privacy paradox' - the discrepancy between concerns on handing over personal data versus the actual action of handing over data (Wilson & Valacich 2012, Barth & De Jong 2017). The consumer's choice is irritational in that the data is handed over in the absence of information of actual benefit and data protection. Wilson & Valacich (2012) specifically also discuss the link of the irrationality of providing personal information, even with just a perceived benefit of immediate convenience. Here again, asymmetry of visibility comes into play as the synoptic promotion can be curated to show positives and not the risks of providing one's data. The inner machinations of this process of datafication and its intended use remains opaque to the individual, especially as more private players get involved (Zuboff 2015).

3.2.3.3. Data-double and Fragmentation

Surveillance and datafication are performed by the concert of the banopticon and the synopticon as shown above. These play out in daily life and livelihoods in specific ways, with liquidity performing a 'fragmentation' of social relationships and social institutions (Staples 2013). The fragmentation of institutions begins with the need for flexibility of governmental institutions where increasing privatisation and marketisation of elements of an erstwhile monolithic state become decentralised and diffused across private sectors (Bauman & Lyon 2013).

Fragmentation is seen to be performed in three ways - by digitally intermediated social relationships, the short-termism of institutions, and a breaking down of human contexts as a data-double. Helped by digital technology, there is an extreme individualisation of both lives and work without a need or opportunity to develop social bonds with others (Bauman 2013). This is perhaps most demonstrated in gig-work platforms where the workers are individualised and cast outside any

traditional employer-employee relationship. In the praxis of gig-work and digital platforms, employment is agile and uses flexible labour working in 'untethered' and 'independent' workspaces (Richter & Richter 2020). There is increasing commodification of labour under platforms and results in workers' disembeddedness from employment and social protection (Vallas & Schor 2020). Whereas 'modern' institutions aimed for permanence, durability, and fixity, 'liquid modern' aims for episodicity, rapidity, and flexibility.

Very relevantly, contemporary digital platforms afford flexibility to both capital and labour. As Abrahamson (2004) and Clegg & Baumeler (2010) present, liquidity can allow for a mobile capital and peripatetic labour. This flexibility stems from the fragmentation afforded when workers are managed as unconnected individuals working on atomised tasks. Fragmentation is also evident globally, where digital platforms' capital is not tied up in long-term investment or revenue generation strategies like their 'brick-and-mortar' modern counterparts (Cusumano et al. 2019). Liquified monetisation practices form the financial basis for digital platforms. Data collected from episodic digital transactions of individuals on these platforms are aggregated and extracted for their monetary value. Labour within digital platforms equally has shed employment as a long-term endeavour and is cast as on-demand and just-in-time gig-work (De Stefano 2015). Consequently, where solid modernity was of routinization and stability, a premium is placed on flexibility in the liquid modern times and resulting in uncertainty for workers.

Datafication also adds to fragmentation of surveilled individual's identity as it is made into a data-double. Under overlapping private and public contexts, there is a blurring of identities. There is a predominance of a hybrid 'citizen-consumer' identity assigned to those who come under data-driven surveillance (Lammi & Pantzar 2019). This is further complicated by digital platform's data practices where users straddle roles of being consumers, producers, or a hybrid 'prosumer' (Bardhi & Eckhardt 2017). Users can even become co-innovators within a digital platform (Charitsis 2016). These roles complicate how these individuals experience surveillance and what they expect from platforms themselves.

Digital platforms performance of datafication through synoptic persuasion is also related to creating multiple data-driven user identities. Synoptic surveillance becomes key to their operation, as platforms:

> softly persuade users towards models of normalized behavior and identity through the constant redefinition of categories of identity. If a certain set of categories ceases to effectively regulate, another set can quickly be reassigned to a user, providing a seemingly seamless experience online that still exerts a force over who that user is (Cheney-Lippold 2011, pg. 177).

The fragmentation of contexts and identities through datafication is in fact the very crux of the creation of a data-double. Surveillant visibility is not sought from the human 'individual' as they are not 'in-dividual' meaning indivisible. The data-double is the actual transformation of this seemingly whole into a datafied 'dividual' (Iveson & Maalsen 2019). This dividual, meaning a fragmented representation, becomes the focus of platforms data-collection, analysis and algorithmic computation.

The seemingly fixed identity of the human individuals is liquified into the many actions of datafication that users themselves participated in, once coaxed or coerced. This growing footprint of data renders visibility of the individuals more and more indirectly :

> Not only are many relationships of a tertiary nature, where interactions occur between persons who never meet in the flesh, many are even of a quaternary character, between persons and machines. (Lyon 2003, pg. 145).

As the data flows through the platform and its ecosystem, there is increasing acontextual visibility to many more actors acting as watchers. As Trottier & Lyon (2012) put it in the context of online interactions:

> Liquid surveillance facilitates participatory surveillance and online sociality. Yet it also enables data commodification and other types of large-scale scrutiny. Identity becomes more liquid as a result of ubiquitous opportunities for speaking about one's self as well as about one's peers. This is typically fuelled by participatory motives, but also enhances other kinds of online surveillance. (Trottier & Lyon 2012, pg. 93).

Sharing, connectivity and a desire to be seen within the society, all mediated by digital technology, is indeed the nature of interaction in Bauman's liquefied world. This enables visibility through online networks and the sharing of data as identity and profiles (De Hert 2012).

As datafication grows, data-driven identity is still under scrutiny across the network (Masiero & Bailur 2021). But the meaning of what identity means will change as it is built on accumulated data traces recombined as profiles. These recombination of data across digital platform ecosystems is undertaken as an 'algorithmic identification and categorisation' (Cinnamon 2017). The algorithmic choices are made by platforms by which users' datafied actions, behaviours, interactions and many other data-traces combine together in a way that is helpful for the platform's surveillant capitalist aims (Cheney-Lippold 2017). These identities are ephemeral, relative and hybrid. What user sees of themselves through their data-driven identity is algorithmically dictated and in the control of platforms. As the user's engagement with platforms increases, their data-driven identity will also change over time. The identity they experience will also be different from the categorisation assigned to them as seen by those they interact digitally within the platform. These multiple categorisations

exist simultaneously. Ultimately the datafied identity itself becomes liquid, without a specific defined stable form.

In summary, practices of surveillance have a direct bearing on individuals seeking participation with a digital platform context. The ideas introduced here, of liquid surveillance, can subsume surveillance's social function as 'inclusion' sought by marginalised individuals. As seen in the conceptualisation of liquid surveillance inclusion is sought under the aegis of banopticon, supported by the synopticon and performed by datafied identities. These multiple modes of visibilities become analytical categories with which to query inclusion. These ideas are extended further in the next section, positioning inclusion as an issue of social justice and demonstrating the link to surveillance.

3.3. Understanding Inclusion

There are multiple scholarly perspectives on inclusion, both as a concept and studied as a benefit of digital technology. This section introduces a few of these critical perspectives to position a social justice view of inclusion.

The definition of social inclusion, specifically under governmental efforts, is presented as a 'positive vision', seeking for all citizens a 'full and equal participation' in society (Bevir 2008). This understanding of inclusion with 'participation' at its core is found across disciplines and practices even when 'inclusion' itself is not directly defined. For instance, governmental programs in the global North deem social inclusion squarely as a complex aspect of participation in economic work, cultural life, and a political voice in their daily lives (see Board 2012).

Under the regime of digital technologies, 'participation' finds a direct role to play in inclusion. Warschauer (2004), in a famous call for studying 'social inclusion' ICTs and terms inclusion as a means of 'full participation' in the society aided by technologies. Mossberger et al. (2007) extended this idea of participation becoming central to the definition of belonging in the community. They further term 'digital citizenship' as referring to participation in the technology mediated society, especially through the governmental process of being included. This theme of 'participation' also finds prominence in the discussion of 'financial inclusion' of the marginalised into the mainstream economy and is intimately connected with governmental and private programs of inclusion. This can be seen in research conceptualising 'development', 'poverty reduction' or 'pro-poor' access to digital financial solutions, as an ability to participate freely in the economy (Chibba 2009, Sarma & Pais 2011, Lagna & Ravishankar 2021).

Developments in recent research add nuance to the understanding of inclusion, challenging the dominant idea that digital participation being always beneficial to those included. Schelenz & Pawelec

(2021) critique that developmental impacts expected out of ICTs essentially take a neoliberal stance aimed for innovation or efficiency improvement. This is particularly seen in outcomes of inclusion that claim financial gain or promise universal participation to the socioeconomically marginalised populations. In a similar early critique that still rings true, Pieterse (2010) argues that digital technology deployments mainly espouse a capitalist logic seeking to expand markets and plot a path of financial progress, while side-lining any inclusion or development in other non-economic domains .

In seeking to understand inclusion, this thesis pick on this thread of participation as it applies to digital platforms. As discussed earlier in this chapter a lens of 'social justice' was found most appropriate to conceptualise inclusion within digital platforms. This is further connected to understanding inclusion as a holistic idea of participation. Here Nancy Fraser's (2000, 2008, 2013) engaging argument of complex tripartite participation as justice is made central to the research framework. By using Fraser's work, the rest of this section draws on academic literature on surveillance that shares a common strand with the theorisation of social justice to demonstrate how inclusion can be understood within digital platform contexts.

3.3.1. Inclusion as 'Parity of Participation'

Fraser (2000) presents a vision of inclusion understood as the ability to freely, justly and equitably participate in society. In this view, social justice is only achieved through the achievement of 'parity of participation' (Fraser 2008). She sees economy, culture and politics as interconnected and equal domains of society; and the access and participation in these domains unhindered by any factors is the true definition of social justice. Following on from this, she presents three dimensions of justice as economic redistribution, cultural recognition and political representation (Fraser 2009a).

Using the three dimensions Fraser (2008) depicts an era of 'abnormal justice' as opposed to 'normal' justice. An abnormal view of justice is needed because extant 'normal' justice operates under a guise of standard definitions of 'who' the actors are, 'what' the substance of justice is and 'how' a process of justice works. The what, who and how constitutes 'nodes' of social justice. Normal contestation and claims for justice work under the assumption that every participant agrees with the prevalent definition of these nodes. A need for an abnormal view of justice emanates when the very definitions of the nodes are unjust and needs to be challenged. For Fraser (2008), accepting a normal discourse of justice rests on the suppression of any dissent. In her words:

> one may well suspect that [normal justice] rests on the suppression or
> marginalization of those who dissent from the reigning consensus. (Fraser 2008,
> pg. 294).

Fraser introduces a normative principle of 'parity of participation' to consider such dissenters' voices. Under this principle:

> …justice requires social arrangements that permit all to participate as peers in social life. (Fraser 2008, pg. 405).

This parity establishes common understanding of critical elements of justice- given by the nodes of 'what', 'who', and 'how' of justice. Of relevance to studying the inclusion of the marginalised within a society, this parity is not present, and it is sought. The path to social justice then is in doing away with barriers to achieving parity :

> On the view of justice as participatory parity, overcoming injustice means dismantling institutionalized obstacles that prevent some people from participating on a par with others, as full partners in social interaction. (Fraser 2013, pg. 164).

Under abnormal justice, the 'what' of the justice is then profoundly changed. A wider conceptualisation of justice with multiple meanings emerges. Fraser (2008) presents the inversion as three societal injustices describing abnormal justice (see table 3.2 below).

Facets of 'Abnormal Justice' and their explanation
Parity of Participation: Overcoming injustice across the three below dimensions preventing individuals from participating on par with others as full partners in social interactions.
Maldistribution: Economic injustice due to the denial of financial or economic resources. Manifests as subordination due to lower income, wealth or access to other financial resources.
Misrecognition: Cultural injustice due to unfair hierarchies of cultural value. Manifests as the subordination in social standing based on cultural markers such as gender or caste.
Misrepresentation: Political injustice due to the denial of equal voice in public deliberations and democratic decision making. Manifests as subordination in access to procedural or legal recourse.

Table 3.2: A review of concepts in 'Abnormal Justice'
- as presented by Fraser (2008).

Maldistribution is the injustice concerned with the economic domain where the distribution of resources is unequal. The absence of parity in the economic domain like lower-income, wealth, or other financial value markers will define an economic class structure based inequality in society. Misrecognition, which is the injustice within the cultural domain of existence conceptualises respect

or esteem being unequal due to embedded cultural hierarchies. The absence of parity in this domain creates an unfair hierarchical order in social standing, with individuals or groups being despised and discriminated against due to cultural markers such as gender or caste. Misrepresentation refers to the injustice in the political domain where participation within the politico-spatial society is unequal. The absence of parity in this domain creates political voicelessness unable to access democratic institutions.

Thus the three dimensions of participatory parity – as redistribution, recognition and representation model inequalities inherent in society.   Within the debate of surveillance, this presents a possibility to understand inclusion as 'parity of participation' – of individuals being able to participate equitably across economic, cultural and political domains. As Fraser (2007) presents:

> each of the three dimensions (economic, cultural, and political) identifies a fundamental, irreducible dimension of social power. Corresponding to a distinctive mode of subordination and genre of injustice, each picks out an order of power asymmetry that poses a distinctive type of obstacle to parity of participation. (Fraser 2007, pg. 333).

Understanding these three dimensions and corresponding modes of subordination deepens the engagement with marginalisation. Discussions on marginalisation and participation has to address the undercurrent of domination and subordination between the actors involved (Singh & Flyverbom 2016). A dominant group defining the framework of participation tends to prioritise their own advantage and causes conditions for non-participation or discrimination for subordinated groups. This applies to many contexts, as Fuchs (2021) discusses:

> Exclusion is a process through which domination operates. Marginalization is the result of domination: one group has disadvantages, while another one benefits. Domination operates through a variety of processes and structures, including exclusion, the state, the law, surveillance, violence, warfare, and rules. (Fuchs 2021, no pagination).

Picking up on these ideas to understand the link of inclusion to surveillance the following sections will discuss the dimensions of participation in relation to surveillance and datafication as theorised earlier. The discussion is structured to consider initially the 'dichotomy' of 'redistribution and recognition' (as was first conceptualised by Fraser (1995)) within the dimensions to achieve participatory parity. This will be followed by discussion of representation as the third dimension to add further context.

3.3.2. Redistribution and Recognition

Surveillance as a process in which marginalised populations seek participation into the wider society can be understood as a function of 'recognition' (Brighenti 2010, Lyon 2016a). Inclusion as recognition

is coherent with Fraser's (2000) argument giving a research framing that can explore the complex outcome of participation. Bauman (2001) squarely places 'recognition' as a function of demonstrating belonging within society through an individual's socio-demographic identity. Moreover, in wider literature recognition as a socio-political construct is intertwined with issues of inclusion & marginalisation (Taylor 1997, Lister 2004), visibilities & surveillance (Brighenti 2010, Boellstorff 2013, Lyon 2016) and of course, as part of social justice (Fraser 2000).

In discussions of liquid surveillance, recognition is placed squarely in its surveillant context. From reading Bauman & Lyon (2013), it becomes clear that the mode of surveillance best exemplifying recognition socially is the 'banopticon'. Exploring the banopticon beyond its technological function, two aspects of surveillance are relevant here – establishing one's identity and establishing one's category as being included or excluded. This act of demonstrating identity and category, and s one's position within the society, has been understood as 'recognition' (Taylor 1997, Brighenti 2010). Taylor (1997), in the same line of theorisation as Fraser (2008), presents that there is a need to be recognised in the society as a citizen, resident, consumer or any other social role one plays. This role hinges on defining one's identity, providing their peers and the wider society an understanding of who they are. At its core, this definition of identity is the social function identification, and datafication technologies are expected to play.

The role of recognition can be read particularly in the work of Bauman & Lyon (2013) when they position it as an act of inclusion, as a solution for marginalisation and as being subject to surveillance by banoptic visibility

> The promise of enhanced visibility, the prospect of 'being in the open' for everybody to see and everybody to notice, chimes well with the most avidly sought proof of social recognition, and therefore of valued – 'meaningful' – existence… [This visibility works as an] antidote against the toxicity of exclusion – as well as a potent way to keep the threat of eviction away; indeed, it is a temptation few practitioners of admittedly precarious social existence will feel strong enough to resist. (Bauman & Lyon 2013, pg. 26) .

Technologies like digital identity and data-profiles as banopticon inherently work as gateways to digitally mediated transactions and interaction. A similar adoption is seen in recent works where scholars employ recognition to understand the place of individuals within a platform context. For instance, Faccennini (2021) uses recognition to showcase how social media develops digital self-identity. A similar approach by Visser & Arnold (2021) places recognition at the heart of gig-workers experiences in negotiating digitally mediated work.

Further theorisation places visibility through recognition in the context of inclusion. Brighenti (2010) consider that an 'individual recognition' is sought by the marginalised to be 'seen' by the state.

This mirrors Fraser's (2008) construct of recognition as the pursuit by the minorities and the marginalised to claim their social identity to participate in society. Similarly, state regimes of identification, including the use of identity cards, technological artefacts (like smart cards), and digital artefacts (like biometrics or identity numbers) are applied to 'prove' identity and thereby the individual presents their self as a unique, recognisable entity to the state, market and wider society (Ajana 2020).

There are certain assumptions that Fraser (2000) challenges in engaging with recognition which is of interest to this discussion. The predominant view of recognition as a function of the state acknowledging its subjects has been under what is presented as a 'Hegelian master-slave' dialectic and as the 'struggle for recognition' (Honneth 1995, Taylor 1997, Fraser 2000). The social identity of the 'slave' (read as a citizen) is predicated solely on the 'gaze' of a dominant 'master' (read as the state). Both the citizen and the state here arrive at a mutual-recognition of each other's role in their bounded master-slave relationship (Lash and Featherstone 2001, Fraser 2000). Fraser challenges the master role of the state or any powerful institution. Recognition in the Hegelian view is guaranteeing the identity of the individual as a citizen or the acceptance of the individuals belonging to a group. The negation of recognition is the absence of being acknowledged a position in society. But Fraser (2000) presents that justice must be about overcoming dominant cultural values already inscribed by powerful institutions, like when states depreciate the status of particular groups of people. Recognition as the cultural dimension of social justice then achieves parity to participate by overcoming extant misrecognition due to 'social subordination' of individuals in society.

Citing Fraser (1999) on the idea of an inclusive recognition as a dimension of social justice, Bauman (2001) terms recognition as having moved away from the earlier stated 'Hegelian master-slave' construct where a powerful entity recognises the powerless. It is not the only mode of recognition that exists as Bauman (in Bauman & Lyon 2013) presents. This is connected to the deterritorialization of surveillance under liquid modern conditions. The bounded nature of surveillance as a top-down monolithic state function has transitioned to a fragmented surveillance into unbounded means with both state and private actors to from a multi-directional network. Similarly, Bauman (2001) bases his view of recognition citing Fraser (1999), in earlier work presenting a deterritorialization of recognition itself.

Here recognition is not anymore, only within the bounded master-slave relationship of a powerful state as master in a give-and-take relationship of recognition. A fragmentation under liquid modern conditions occurs, helped by networked technology and consumerism. The primacy of the state as the master providing indubitable recognition has transformed with the involvement of private actors like corporates and citizen peers acting as the providers of recognition. Terming this change as

the 'great war of recognition' where the 'struggle' for recognition is not between only a slave and master, but the 'war' is for recognition of 'all' set against 'all' (Lash and Featherstone 2001). The 'all' in this is to signify that recognition too is a multi-directional social recognition sought by citizen interactions within the society.

Ultimately, an individual's belonging and citizenship are a result of being recognised not only by the state 'from above', but also by the dynamics of recognition 'from below' – that is, by social recognition across peers (Stepputat 2004). This framing of recognition sits comfortably within the function of liquid surveillance as involving multiple visibilities. Much as datafication and surveillance fragment humans as dataflows, it fragments their ability to seek recognition into one solid identity. They are in the liquid process of seeking recognition fragmented across their social relationships.

Fraser (2000) deems that a freestanding 'cultural' conceptualisation of society has missed the economic component of participation, of seeking fair redistribution of resource – or distributive justice. Further, Fraser (2000) argues that identity is shaped by recognition or its absence within the society having direct non-cultural social impact – and as has been observed, these impacts are manifested in economic terms in many cases of marginalisation. This can be further contextualised to understand link of surveillance and justice, the connection to the banopticon's function of defining inclusion and exclusion.

Under liquid modern condition Bauman presents that the difference between the included and the excluded are mainly in consumerist dimension. The banopticon stratifies society according to individuals consumerist ability (Bauman & Lyon 2013). The included as 'seduced' are the free consumers able to participate in the economy effectively and are on the right side of the banopticon. The excluded or the 'repressed' are flawed consumers facing constraints in economic participation. Bauman's earlier works also discuss similar social stratification between the 'haves' and the 'have-nots' (Davis 2008, Crone 2008).

Fraser's (2008) theorisation overlaps with the idea of 'flawed' consumers of Bauman, as they are excluded mainly on economic terms. Bauman (2001), cites Fraser's conceptualisation of recognition entwinement with redistribution under social justice, and argues that the plight of the excluded 'seekers of recognition' needs to be understood beyond just a standalone cultural aspect of participation. He denies that there is no clear automatic cultural belonging as a citizen, and calls for an engagement into economic participation as consumers. This echoes the main focus of Fraser in presenting economic redistribution and cultural recognition as a 'dualism'. She presents that economic subordination as a barrier to justice is an objective condition, framed by intersubjective prejudicial cultural subordination due to:

…institutionalized norms that systemically depreciate some categories of people and the qualities associated with them (Fraser 2009, p. 79).

Elsewhere she says:

Cultural norms that are unfairly biased against some are institutionalized in the state and the economy; meanwhile, economic disadvantage impedes equal participation in the making of culture, in public spheres and in everyday life. The result is often a vicious circle of cultural and economic subordination. (Fraser 2020, pg. 72).

Fraser (2008) considers inevitable the entwinement of the cultural and economic mode of participation – recognition and redistribution. While analytically recognition and redistribution are distinct, in relation to the marginalised and surveillance, that the absence of recognition provided by banopticon means there is no possibility to engage beyond its consumerist border, and thus eventual economic participation is not possible. So, the marginalised populations are driven by a need for economic participation to seek recognition within society. Thus without their intertwining, full participation in society is unachievable. Fraser (2009) presents in this:

When pursued in contexts marked by gross disparities in economic position, reforms aimed at recognizing distinctiveness tend to devolve into empty gestures… In such contexts, recognition reforms cannot succeed unless they are joined with struggles for redistribution. In short, no recognition without redistribution. (Fraser 2009, pg. 85).

This can be appropriated to typify a positive effect, as the inclusion of the surveilled individual being desirable. But only when they are socially recognised to belong to the 'right' economic category.

Datafication works to intensify this condition. Within digital platforms, social recognition is carried forward wherever the data flows, across the networks in myriad ways and supported by the multiple fragmentations as described. Data-driven identities and profiles (De Hert 2012, Masiero & Bailur 2021) can cross the consumer arena into the citizen arena, bridging the individual's social belonging more pervasively to a combined factor of economic and cultural participation as Fraser (2008) posits. The result is the erosion of difference between the public and the private leading to a hybrid 'consumer-citizen' identity (Lammi & Pantzar 2019).

Cinnamon (2017), in a similar discussion on datafication, presents redistribution as a dimension of participatory parity should be further considered in light of the 'economic value' of data. As the individual hands over data in exchange for services in a datafied society, Cinnamon (2017) argues that the economic value of aggregated data, as exploited by large corporations like Facebook

or Google, leads to constraining participatory parity of individuals. He shows an injustice of maldistribution as data exploitation occurs along a misrecognition of wrong classification of status of the datafied profile in a networked society.

The presence of consumerist terms in surveillance can be understood in the context of a 'securitisation of identity' – echoing the wider securitisation of society (Muller 2004, Barnard-Wills 2009). Muller (2004) presents that much like the state increasing risk profiling and tactics of control at the border for 'national security', within national borders, private identities of citizens are put through the same principles of securitisation, accelerating the spread of authority where identification becomes core to consumer transactions. In the digital era, risk-profiling and associated analytics regularly play out in the economic domain protecting institutions from the financial risk of allowing participation of risky individuals (Van Brakel 2016). Again, this is seen when the state or the market uses trust mechanisms through data-driven identities presented in economic terms found in credit and risk profiles (Flyverbom 2017).

As banks and financial institutions press for risk profiling and securitising identification for their customers, the state is economically and politically pushed to echo this. Within recent years digital identity is positioned explicitly as the solution to address both the concerns of the state and the private sector (Beduschi 2019). This direct implication of commercial aspects of an individual's life with their belonging as a citizen again signals the entwining recognition and redistribution as a dimension of participatory parity as Fraser (2008) presented.

3.3.3. Representation

The third dimension of social justice, presented by Fraser (2008), is representation. She extended the initial dualism of recognition and redistribution framed by political representation. As Fraser puts it, representation is the political 'stage on which struggles over distribution and recognition are played out' (Fraser, 2007, p. 313). This dimension then seeks out fair political representation and equal voice in processes that make the rules and decisions within society.

Fraser presents that the 'full participation' of individuals in the society can be deeply affected by factors that:

> … deny them equal voice in public deliberations and democratic decision making;
> in that case they suffer from political injustice or misrepresentation. (Fraser 2008,
> pg. 406).

It signals the lack of a political 'voice' for those left out of political processes and becomes the main barrier to their parity. By this, Fraser (2008) subsumes the political struggles for representation faced

by minority and marginalised groups in the deliberative democracy. Even as individuals achieve recognition and redistribution favourably, the lack of representation in the pollical realm can deny parity. As Fraser presents:

> … distribution and recognition are political, because both of them concern power asymmetries and structures of subordination. (Nash & Bell 2007, pg. 75 – interview with Fraser's words quoted).

For instance, even when certain groups like women and ethnic minorities are members of the democratic polity, there is a denial of participation in making the legal frameworks due to the political composition of the society (Fernandez 2011). This line of analysis can particularly help understand marginalisation in society and the related 'power struggles' in the context of rampant datafication that Arora (2016) problematises as needing specific attention.

As a whole, Fraser presents the analytic framework of justice, where the three dimensions of participatory parity discussed operate within the same politico-spatial 'frame'. Here, a 'frame' is the typification of a societal setting, not necessarily limited by geographical boundaries. So, when injustice in the political dimensions occurs within a frame, it is an 'ordinary political misrepresentation' much like the non-representation of women in legislative bodies (Fraser 2008). But a meta-political injustice called 'misframing' is presented - where one's membership to the frame itself is taken away. Their claims to justice through redistribution, recognition or ordinary political representation cannot even be made as they are not considered part of the frame. In continuing the above example, misframing would be the status of women before universal suffrage or extension of proper rights for women. In such a situation, they were denied participation in multiple realms by a legal and political definition (which of course, extends unfair subordination into cultural and economic realms).

At this point, consider the nature of the banopticon as an element of surveillance and being the notional border of inclusion (Bigo 2014). As discussed earlier, the normalisation of this border and the ban in banopitcon forms part of a political process. Here, fairness of how and who defines the ban is brought into question as an issue of political parity. Wrongful, unfair or oppressive definition of the border could leave out individuals beyond the border in absolute abandonment (Bauman & Lyon 2013) or, as Fraser (2010) presents, undergo injustice of 'misframing'. This could be understood through the example of the so-called 'illegal immigrants', who have no recourse to justice under the given frame of a nation-state and its laws when their participation as a political entity is unfairly denied.

Further, as Fraser presents, this frame does not need to be a nation-state. It can be a 'post-Westphalian' environment. Fraser's conceptualisation of the frame acknowledges non-state actors and the claim to justice that need to be made to them in contemporary society. Any lack of parity in

the representation in a frame governed by non-state actors could be considered a 'meta-political misrepresentation' (Fernandez 2011). For instance, those on Twitter could be considered to be in one frame. In this example, suppression of one's specific political views by the Twitter platform maybe by deletion of tweets, is an injustice of political misrepresentation, thereby constraining their participatory parity. But this misrepresentation is in a meta-political sense, in that recourse to parity is not necessarily through the nation-state. It is through claim to justice done to Twitter's own bye-laws in the first instance. Any failure of that makes it a trans-national legal issue, as numerous Twitter cases have played out in contemporary society. This political justice is of interest, as datafication is run through private, non-state actors and the heavy involvement of private platforms and corporates in surveillance infrastructures (Cinnamon 2017).

The nature of representation also needs to be understood beyond the direct political meaning of democratic representation of individuals in their civic role. Fraser (2008) also presents this as the 'procedural' aspect of seeking equitable participation in society. This subsumes the definition of processes and procedures in seeking participation and seeking recourse to justice when participatory parity fails. This could be through existing legal frameworks of justice within a nation-state. In a post-Westphalian frame this would resort to the agreed terms of participation. As the terms are dictated outside a 'normal' framework of justice, there is potential for the participation to be set on 'exploitative terms of interaction and then exempt them from democratic control' (Fraser 2010). In digital contexts, it is possible to understand this as the 'terms and conditions' of signing-up to online service – as once would in the case of the earlier presented Twitter example.

Further, procedural fairness in participation finds a prominent place in the context of surveillance and technology. Privacy concerns in surveillance have long been considered under the fairness of procedures. For instance, 'information disclosure' for data collection and processing is considered the 'voice' of the users represented to the decision-makers (Bies 1993). In the more recent datafied condition of surveillance, this has been reflected in 'informed consent' procedures and in options for 'opt-in' or 'opt-out' as a 'fair' element of collecting data (Ashworth & Free 2006, Fuchs 2011). More recently, Nagtegaal (2021) finds algorithmic decision-making in the public sector as an issue of procedural justice. They find that human managers' decisions are perceived more procedurally just, than those done by algorithms.

Interestingly, the procedural aspect of justice is considered crucial to build legitimacy and trust for surveillance operations. The showcasing of diligence and transparency in the procedures for using exceptional powers related to surveillance is deemed to make those surveilled more accommodating. This is found in contexts of policing (Lee & McGovern 2013), anti-terrorism operations (Cherney &

Murphy 2013) and their routine surveillance counterpart at workplaces (Kidwell & Bennett 1994, Ball 2010).

For a more relevant direct application for surveillance, procedural fairness can be connected to the normalisation of banopticon, which co-opts synoptic techniques. A presentation of fair procedural elements justify the exceptional need for securitisation of identity and thereby supporting normalisation of an extraordinary surveillant incursion like biometric identification. In the commonly presented banoptic example of airport surveillance, it is the synoptic performance of screening as a diligent but fair procedure for everyone's safety that evokes compliance and the normalisation of extreme vigilance measures (Bigo 2006). More relevant to the digital platform context, Pfeiffer & Kawalec (2020) demonstrate similar expectations for performance-related procedural justice as an issue of transparency among online and digital platform mediated workers.

Ultimately, using Fraser's (2008) theorisation, this section has conceptualised inclusion as participatory parity as discussed along the three dimensions of redistribution, recognition and representation. When participation and, therefore, inclusion into the society is challenged or disputed, the focus is not exclusively on one of the dimensions. But it's in how the three dimensions are mutually entwined and influence each other that a complex idea of inclusion is presented (Fraser 2008). Further, the synergy of such an understanding of inclusion has been noted for its relevance to surveillance. Gangadharan (2017) calls for analysis of the interaction between inclusion and surveillance by invoking a complex understanding of social justice specifically as understood by Fraser (2008). By studying surveillance and datafication under a nuanced understanding of economic, cultural and political dimensions of participation allows for narratives of inclusion ranging from digital financial inclusion to fairness in platform's procedures. As Gangadharan & Niklas (2019) presents, the use of abnormal justice framing allows for an intersectional view of inclusive and exclusionary outcomes of digital technology.

3.4. Conclusion

In summary, the theoretical foundation espoused is synthesised at two conceptual levels (Figure 1 below). The first level derives from the theorisation of surveillance presented through crucial concepts of banopticon, synopticon and the data-double. The second level then seeks to understand how these surveillant elements enable or constrain cultural, economic and political justice dimensions of participation, understood as inclusion.

The theoretical framework using lenses of 'Liquid Surveillance' (Bauman & Lyon 2013) and 'Abnormal Justice' (Fraser 2008) provides the following analytical categories (table 1) with which to approach research.

Surveillance – as 'Liquid Surveillance'	Inclusion – as 'Parity of Participation'
Banopticon keeping undesirable population out and allow inclusion for individuals.	The need for social identity as cultural **recognition** sought by individuals from state and non-state actors.
Synopticon that seduces the desirable individuals to part with data.	Betterment in access to financial resources such as income, wages and credit as economic **redistribution**.
Data-double as identity and profiles aggregated across the platform ecosystem	Voice and procedural fairness in practices of platform as political **representation**.

Table 3.3: Analytical categories used in research
- derived from Bauman & Lyon (2013) and Fraser (2008).

The disciplinary panoptic 'top-down' power as the main understanding of surveillance visibility has been replaced with the complex elements of visibility in a liquid surveillant society (Lyon 2010, Lyon 2016a). Banopticon enacts individual identification and categorisation to define who is in the right category to be included in the society (Bigo 2014). The state and the market frames rules defining how and who is considered desirable to be included through such surveillance. Using a social justice lens, these rules and the inclusion itself can be viewed to be performed across economic, cultural and political domains (Fraser 2008).

Further, visibility through the synopticon as 'bottom-up' view of power is conceptualised (Mathesien 1997). Here, the individuals watch the powerful entities of the state and the market who entice them showing the benefits of being included. Drawn by this, the individual hand over their data which becomes a vehicle for further data-driven surveillance (Bauman & Lyon 2013).

Surveillance is also actively sought as means of recognition by the marginalised individuals, especially when a fair procedure is synoptically presented as means of participation. Under liquid surveillance recognition is more socially spread as it is accelerated by networks and datafication (Bauman & Lyon 2013, De Hert 2012, Cheney-Lippold 2017). These visibilities are strengthened by accumulation of data resulting in the datafied representation of the individual (Cheney-Lippold 2017). This as a data double acts as the vehicle for further surveillance. As the spread of datafied visibility increases, recognition has potential for negative impacts as well (Lash & Featherstone 2001). To understand this, the underlying social justice paradigm has to be invoked to see if surveillant visibilities and recognition work for the marginalised (Bauman 2001, Lyon 2016).

By invoking a complex definition of justice that involves the cultural, economic and political participation in society, social inclusion of the marginalised can be understood as a more holistic

process and intersectional outcome. A closer inspection of the transactions and experiences of surveilled individuals using the mentioned concepts can help understand: how datafication is achieved, how surveillance is performed, how it spreads, how data can be misused, how and to whom data adds economic and non-economic value, and how and if a holistic and intersectional inclusion is achieved.

Thus, the theoretical foundation provides broad analytical categories of surveillant visibilities and dimensions of social justice. These concepts can be employed to conceptualise inclusion under surveillance as both positive and negative attention on the marginalised section of the population. The analysis is carried forward in this thesis building on the theoretical foundation laid out here, with the following chapter detailing the methodology undertaken by this thesis.

4. METHODOLOGY

This chapter presents the research design and its underpinning research philosophy. This study uses the research design framework presented by Ritchie et al. (2013) and Saunders et al. (2016), along with other works (Creswell 2009, Myers 2009). The following section presents the justification for an interpretivist research lens, and then the chapter delves into a detailed discussion of the research methods used and a discussion of the data analysis.

4.1. Research Positioning

For this research project which entailed studying digital platforms as complex information systems with various moving parts and technologies, I aimed to reconcile two specific issues. First, the research must subsume that surveillance and inclusion, at their core, are social phenomenon and born out of social relationships between people as actors. Secondly, surveillance and its multiple manifestations and underlying mechanisms are constructed in a deeply technological context with the prevalence of technical and data artefacts. The point of departure for this research then is that surveillance and inclusion are to be studied as complex socio-technological phenomena. This guided my approach further to dictate the ontology, epistemology, and methodology of the research.

In this research, as established by the previous two chapters, I am interested in understanding the experience of actors within a platform ecosystem observed through their socio-technological interactions with other actors and the mediation by digital technologies, and further how their actions and relationships affect the social meanings they perceive, particularly of surveillance and inclusion. Ultimately this thesis considers that reality in such a view is in flux and in the process of being socially constructed, and thus bearing a tag of social constructivist ontology (Saunders et al. 2016). This ontological position has a strong bearing on me as a researcher within information systems. My research then probes the context of the social actors and the technology involved to gain knowledge of the underlying subjective reality (Richie et al. 2013).

I adopt an interpretivist epistemology which is quite commonly used with qualitative research to understand how reality is constructed through both social and technological aspects (Ritchie et al. 2013). An interpretivist worldview especially has been applied widely to the study of information systems as socio-technological systems. As discussed by Orlikowski & Baroudi (1991), the shift from positivist focus to interpretivist research allows the study of 'complexity, ambiguity, and instability' within information systems, which is very relevant to the context of my research on platform ecosystems. An interpretive lens also considers the implication of choices that researchers make as they are not necessarily considered a neutral entity. This is a valid view I took into account in my

research on prevalent digital private and public platforms; I have engaged as a customer, as a citizen and as a worker – all of which contributed as auto-ethnography, supporting other methods of enquiry.

Particularly interpretivism presents research with a valid means to explore multiple subjective realities which are socially constructed (Oates 2006). This then translates that the research must study multiple social points of view to understand the contradictions in meanings and interpretations among the actors involved. In line with what Klein and Myers (1999) describe, an interpretive study focuses on 'social constructions such as language, consciousness, shared meanings, documents, tools, and other artefacts. These points are particularly relevant to my choice of readings into literature that engages with multiple meanings of surveillance and inclusion, which informs this research heavily.

My research philosophy guided by the ontological and epistemological dyad directs the choice for an approach to data collection. Some of these were easy choices to make and were natural to my interpretive leaning. Unlike positivism with its objective, observable and quantifiable reality, I approach reality as a complex subjective construct presented by meanings and interpretation of people, in each experiencing their own versions of reality (Goldkuhl 2012). For this interpretivist framing, a qualitative approach with an aim to position research within rich contexts was an obvious choice (Andrade 2009, Punch 2013). Further in the approach to connecting qualitative data to knowledge, I follow a combination of deductive and inductive approaches to research (Dubois & Gadde 2014, Saunders et al. 2016). In this, the research perhaps follows the illuminative tenet of Strauss & Corbin (1988) as cited by Gasson (2004):

> We are deducing what is going on based on data but also based on our reading of that data along with our assumptions about the nature of life, the literature that we carry in our heads, and the discussion that we have with colleagues. (This is how science is born). In fact, there is an interplay between induction and deduction (as in all science)." (Strauss & Corbin 1988, pg. 136-137)

Here theory and data iteratively act to inform how knowledge is sought during the research process. The connection of this combined deductive-inductive research approach to how theory sensitises the way data is understood and interpreted is dealt with in later sections.

4.2. Interpretive Case Study

Interpretivist research is compatible with many qualitative research methods. Specifically, in information systems research, this perspective has been used with methods such as case study, qualitative content analysis, interviews, ethnography/hermeneutics, grounded theory, participant observation and action research (Mingers 2003). The research methodology I use in this thesis is primarily of interpretive case study supported by ethnographically informed methods of field

observation, semi-structured interviewing and an auto-ethnography of when I worked as a 'gig-worker'. Further to this, coding was done using 'template analysis' as a way of structuring data and in keeping with the use of combined deductive and inductive approaches where data analysis was sensitised using defined theoretical frameworks (Flynn & Gregory 2004).

As I study a contemporary issue of platform ecosystems, with multiple different facets to it, I rely on building multiple case studies upon which to theorise. The research uses a 'holistic' case study design, where the multiple empirical case contexts are analysed using one unit of analysis. This approach of using multiple cases studies is an effective way of achieving validity by comparing contrasting findings of different case contexts, adding to the rigour of the research process (Yin 1994, 2003). Gustafsson (2017) echoes this advantage of a multiple case design but warns of the time and resource requirement needed for the completion of each case study. In my overarching research process, this was mitigated by undertaking fieldwork and the building of a case study in 2 related but distinct phases – of digital identity platform as a case in phase 1, of gig-work platform in phase 2. The data from these were also brought under an overarching platform ecosystem paradigm after the fieldwork was completed.

The holistic nature of my case study research is seen to play out in detail within the presented papers. In the paper (number 1) on Aadhaar, the unit of analysis is at a digital identity platform level with multiple groups of workers as individual cases. This is repeated in the paper (Krishna 2020) on spatiotemporalities by a study of multiple groups of food-delivery workers; all analysed at a digital gig-work platform level. The third paper on the theoretical construct of 'liquid inclusion' builds on the case studies from the two other papers to analyse at a 'platform ecosystem' level involving the contexts of workers within both digital identity platform and gig-work platform. Simply put, my case study design was aimed at understanding workers' social experiences within multiple case contexts, all contributing to a theorisation of their experience as actors of an integrated platform ecosystem case study. Very relevantly for my thesis, which seeks answers for 'how' and 'why' questions, case study as a method fits well. Especially in studying a contemporary phenomenon of digital platforms, interpretive case study also lends itself to the exploration of the complex relationships within the specific case of interest (Yin 2009).

Further, interpretive case studies are deemed a fit for the development of theoretical concepts, especially in the use of multiple theoretical strands as has been undertaken here (Dobson 1999). Using an 'interpretive' means of the analysis of cases also provides the possibility of reducing any bias of research as it is possible to synthesise contradictory viewpoints from the empirical data (Klein and Myers 1999). To achieve theory building or extension of existing theory as applicable to this

research project, case study methodology provides the ability to synthesise qualitative data focused on answering well 'scoped' research questions (Eisenhardt & Graebner, 2007). Conversely as Eisenhardt (1989) presents in interpretive information systems research, theory can help in both guiding design and data collection in the case study and to analysing data in iterative means.

Walsham (1995) stresses the need for reflection or reflexivity in conducting interpretive case studies as the positionality of the researcher makes their own self-critical thought important in attaining good research results. This is a very valid concern in my research process as I engaged in the field as an auto-ethnographer. To achieve reflexivity, I fall back on what Alvesson & Skolberg (2017) provide as a particularly useful means of approaching interpretive research. They present four levels of interpretation (see table 4.1 below), especially to attain a reflexive means of researching – which was applied in building the interpretive case study research.

The first level is 'interpretation of empirical' data, including interviews and other materials. Here the research process must identify the potential multiplicity and pluralism in how interpretations occur. The second level focuses on the actual 'interpretation' of meanings from the accounts. The third level is of 'critical interpretation' focusing on building interpretive accounts of power, social relationship, opposing views in interpretations and how they affect actors, and considering why certain interpretations dominate. Finally, the researcher is to focus on reflection, to understand the data to identify authority and marginalisation of voices.

Level of Interpretation	Expected focus for the Case Study
Interaction with empirical material	Interviews accounts, observations, and other empirical materials (including text)
Interpretation	Underlying meanings of specific concepts.
Critical interpretation	Power, social relationships, and how they work within the given case.
Reflexive Interpretation	Identification of authority, marginalisation and selectivity of the voices represented across data including interviews.

Table 4.1: Approaching interpretive Research
- developed from Alvesson & Skolberg (2017) and Pozzebon et al. (2014)

This provides a good reference for interpretive case study, especially in engaging with the contradictions within digital platform experiences, seen as aspects of power relations. This is true in the experience of both surveillance and inclusion as faced by the marginalised population under study. Further, these four levels of interpretation do not occur independently, as they can also interact and

be combined to create further reflexive insights. By espousing interpretivism of such a flavour, this research ultimately aims to create an in-depth, complex and rich account of platform ecosystems. Particularly, the thesis sought to present a critical appraisal of the social world and its context understood through the possibly competing perspectives of the various actors involved.

4.3. Research Methods

In this section, I present a description of and the justification for the research methods used. I used mixed methods to conduct this research, which included semi-structured interviews with workers and auto-ethnographic observations done when I worked as a food-delivery gig-worker within which data was captured audio-visually and also using data sources like digital gig-work apps and Whatsapps. As is common within an interpretivist case study approach, the main source of data was from semi-structured interviews with other methods providing supporting data (Walsham 1995, Yin 2003). Along with interviews of workers within the platform ecosystem, I used auto-ethnography by working as a food-delivery worker and by undergoing biometric enrolment of Aadhaar. During auto-ethnography, data was captured as notes, videos, photos, and audio recordings. Further observations were made in critical field sites like Aadhaar support centres, platform company offices and in worker protests and union meetings.

My auto-ethnography as a worker also enabled me to access and observe digital sites of interest. This was done through Whatsapp groups, which were intended for local food-delivery groups and also during my daily work use of gig-work apps. The data from the use of gig-work platform apps included screen capture and scraping of data from the various screens. Finally, documentary materials were used in the form of technical articles and blogs, or policy papers published by government platforms and in media, specific governmental legislative documents and whitepapers, and documentation like privacy policies or terms and conditions of platform services.

The use of semi-structured interviews, observations and auto-ethnography components were all conducted under an 'ethnographically informed' approach. This meant that, as suggested by Robinson et al. (2007), my research rejects the explanation of objective truth and that interviews and observations were conducted in the 'natural' field settings to understand the subjective realities of the interview participants. These aspects were also automatically embedded in how the auto-ethnographic method was conducted as I experienced the platform ecosystem as a worker directly and was able to observe other workers unfettered in their daily work environment. This access has provided me with the opportunity to ground the research in local socio-cultural issues and be context-appropriate, both of which are hallmarks of ethnography even if they are time-limited, particularly as seen within research on information technology (Beynon-Davies 1997, Schultze 2017).

4.3.1. Semi-structured Interviews

Qualitative semi-structured interviews form the main source of data in my approach to case study research. As Walsham (1995) prescribes, for an interpretive case study, interviews form the primary source to understand subjective contexts and experiences of the participants. Here the interview as an interpretive research tool is expected to be open-ended enough so that the interviewee's views and experiences, reflections and insights can be captured by the interviewer as part of the interaction (Darke et al. 1998). In my research, I used the interviewing style presented by Rubin and Rubin (2011) as 'responsive interviewing'. The responsive interviewing model has four main elements for the researcher to focus on - learn about experiences of interviewees, follow-up including with multiple interviews, treat analysis of interview as ongoing process and place emphasis on interviewee's interpretation of the phenomenon. As an approach rooted in interpretive philosophy, responsive interviewing technique provided me with a method fit to achieve a deeper understanding of the interviewee's interpretations and meanings.

The semi-structured interview uses a set of pre-set themes with which the interviewer can direct the conversation. As a hybrid type, it has been considered to have enough flexibility to keep a conversation flowing without losing out on the quality of openness of the interaction (Saunders et al. 2016). It is also considered that the more open the interview, the richer data emanating from it (Alvesson & Ashcraft 2012). In this, I placed a premium on the design of the questioning being within a broad theme in which the workers were fairly informed so as to get the conversation flowing, and I was also adaptive to any emerging or unexpected directions of conversation.

The interview design then was based on carefully designed research themes conveyed in open-ended main questions, along with follow-up and probing questions that emerge conversationally. The interviews began with an introduction and, in most cases, involved a brief discussion of the participants' demographic details, such as name, age, previous occupation and length of work in the current job. The questions were broadly on four areas: enrolment into Aadhaar, use of Aadhaar, seeking of informal/gig-work using digital platforms, and performing of daily work under platforms. The following table (4.2) shows examples of the initial broad questions, used with specific probing questions, that guided the conversation deeper.

Here I acted as what has been termed a 'conversational partner' with my interview participants (Rubin & Rubin 2011). In the interpretivist tradition, the interviewer should undertake a conversational exchange as part of the interview and engage with relevant topics on social factors like gender or class, invoking ethical or social issues. Ultimately the interview is to produce a rich interpretive output based on mutual understanding of the interviewee and interviewer. Adopting this tenet, I was able to act

reflexively to maintain trust and reliability between I as the researcher and the workers who formed a major part of my interview participants. This reflection was particularly important given the socio-cultural specificities of the Indian context. In the field, I needed to acknowledge my privilege, such as of education, caste and socio-economic status, in making sure that my interview interactions with the worker do not ascribe or communicate any position of power that would influence my relationship with them.

Additionally, I used textual or non-textual aid to direct the conversation. In most cases, this took the form of screenshots or real-time screens of digital platform mobile apps either used by the workers themselves or by me. These also worked to become qualitative data that were used to contextualise the conversation during the coding and analysis phases of the research.

Enrolment and use of Aadhaar:

1. Can you tell me how you got to know about Aadhaar and why you enrolled into it?
    a. Did you need any help or guidance during enrolment?
2. What were your needs and expectations from Aadhaar?
    a. Were there specific services/ programs which you wanted for which Aadhaar was necessary?
3. What are the issues you faced in enrolling or using Aadhaar?
    a. Where do you seek information when there is any issue with Aadhaar?
4. What do you see is the difference in use of Aadhaar with the government and for other needs?
    a. What are your thoughts on sharing Aadhaar with private companies?
    b. Has anyone told it is compulsory to provide Aadhaar?

Seeking and undertaking employment:

1. Tell me about why you joined in this particular job (domestic work / cab-driving/ food-delivery)?
    a. What were your expectations out of this job?
2. Can you take me through the process of how you registered for the job (on the platform/portal)?
    a. How do you feel about finding employment on/working on digital apps/portal?
    b. Did you get help from others in applying for this job?
3. How do you use the app / portal in a typical work day/cycle?
    a. What do you find challenging/exciting about working daily on this digital technology?
    b. What are all the features you use regularly to undertake your job?
4. Can you tell me about your interactions with customers/clients/restaurants?
    a. How does the interaction with the customer/clients/restaurant work on and off the app/portal?

Table 4.2: Examples of initial broad questions and specific probing questions

4.3.2. Auto-ethnography

Auto-ethnography within research has been used by multiple researchers as a way to study personal experiences within specific socio-cultural milieus. As a form of data collection and of reflexive research, auto-ethnography has congruence with the interpretivist paradigm. Research here is done through the researcher's 'both heightened and mundane' experience of the world and the subjective reality seen every day (Dunn & Myers 2020).

While I did not intend this auto-ethnographic phase of research to be heavily digital, given the nature of platform ecosystems and my interactions with it as a worker and as a user, there were multiple digitally mediated situations that needed capturing. The wider literature on digital forms of ethnography or on digital methods echoes this need to account for digital mediation as a major feature of contemporary research (Hjorth et al. 2017). In fact, the 'field' for my research was as much within apps as in the physical world. This is in line with Soukup's (2013) call to follow alternative digital methods in ethnography that can help navigate the digital saturation of contemporary society. Or, as Dunn & Myers (2020) argue, all auto-ethnography is digital auto-ethnography because everyday social life is now replete with human-computer interactive experiences. In this research, almost all auto-ethnography was mediated by digital platform apps. So, in my interactions within both governmental and commercial digital platform contexts, copious digital texts, audio, and visual material were generated as part of the research, and these acted qualitatively to triangulate the observed workers' subjective experiences.

The digital mediation was also evident through how daily work was performed as a gig-worker. True to the nature of work under digital platforms, my auto-ethnography as a gig-worker consisted of multiple momentary and transactional instances mediated by the gig-work app. Further, gig-work is governed by workers' interaction with underlying data manifested through apps that control their spatial and temporal movements. This data is opaque and not always directly visible to the workers. But traces of the data and the algorithms in use can be gleaned from the multiple screens of the apps in use.

In a bid to capture these fleeting points of data, it was necessary to undertake continuous tracking and recording of my own movements and actions. In this, I resorted to an approach taken by previous interdisciplinary researchers of platforms, both gig-work and personal surveillance (Lupton 2016, Moore & Piwek 2017, Waters & Woodcock 2017). These researchers espouse the technique of 'self-tracking' (Lupton 2016), which entails detailed logging and tracking through data generated digitally through mobile phones, global-positioning devices or wearable devices like a smartwatch. In this way, tracking can be directed toward capturing one's own life events, routine and schedules, or

physical and spatial movements. This self-tracking as a paradigm is inherent within gig-economy labour practices as an imposed measure of control and surveillance. But as a method of research, self-tracking has been invoked to replicate opaque data that is held by digital platforms and usually unavailable to workers. For instance, Rosenblat & Stark (2016) recall how Uber drivers log their schedules and route outside of the Uber app in a way to track their own data. Similarly, Water & Woodcock (2017) show that self-tracking was used in the case of Deliveroo apps to build knowledge on food delivery workers movements around the city.

Taking a page from such research, I employed self-tracking of my spatial movements and temporal data generated within the food-delivery apps during my auto-ethnography. This let me observe and record the data generated as well as accessible traces of algorithmic elements within the apps. In a bid to capture the algorithmic and digitally mediated interaction with apps – such as with platform processes, customers, and restaurants – screenshots and screen video grabs of the smartphone were used. Further data from the apps where possible was scrapped with due anonymisation and access control was limited to only me as the researcher and the sole user of the gig-work apps (Rogers 2013). While many of these data points were quantitative in nature, they were used in analysis to support the qualitative narrative of platform apps usage among workers (as can be seen in paper number 2 – Krishna (2020) in the thesis below).

Another main ethnographic issue I needed to contend with was my own positionality as a researcher. A cue for approaching this comes from Butz & Besio (2009) conceptualisation of autoethnographic practices as a continuum. Here one end of the continuum is a construct of 'academic researcher' as an 'agent' of research but striving to place themselves in the research as subjects within a narrative of personal experience. The other end of the continuum is the construct of 'research subjects' who are usually 'objects' of research to taking the roles of the narrator where they produce a non-academic representation of voices as 'auto-ethnography from below'. This view of academic positionality was an important consideration in my research design. Within my auto-ethnographic efforts, I placed a premium on the interpretative value gained to contextualise and understand other workers' social experience of the platform ecosystem. This helped add richer contexts to the semi-structured interview data.

This was also due to my positionality as a researcher, which meant that while my own experience as a worker was invaluable, in this thesis, I was not producing a truly auto-ethnographic text. Rather, my experience is used to punctuate the voices of workers and deepen understanding of the digital context, which is usually opaque when done without the direct experience that this approach afforded me. This chimes with the long-established need for researchers to resolve their

position as an insider in ethnographic research (Aktinson & Hammersley 1998). So, my auto-ethnographic technique meets in the middle of the continuum between a personal experience narrative and a truly representational voice from below. This Butz & Besio (2009) term is the middle ground of an 'insider research' where the researcher works to attain some level of membership within the research subject group, to attain 'experiential access' and then build a narrative that gives voice and representation to the research subjects.

Reflecting positionality as discussed above, in my own research, auto-ethnography served four related purposes. First, I experienced both biometric enrolment into Aadhaar as a digital identity platform and its use to join a gig-work platform. Secondly, I was able to take a deeper look into the daily work practices at restaurants, customer locations and on the road as a food-delivery worker. Thirdly, I interacted directly with digital gig-work apps and their audio-visual artefacts, and through that, experienced the impacts of the underlying algorithms and data. Fourthly, I was able to be part of gig-workers' formal and informal physical and digital milieus. These included first-hand observations at events like protests and meetings, participation in Whatsapp groups, and visiting platform company offices as a gig-worker seeking support.

4.4. Data Collection

The total outline of interviews conducted is presented in the tables below (4.3 and 4.4). I visited the field beginning with a pilot done in Bangalore during April 2017 that framed the trajectory of the two main phases of data collection. The pilot interviews were done as a way to scope out the research, and this ultimately determined my research design. The interviews were with two digital platform creators who managed the blue-collar recruitment portals with a presence across major cities in India, including Chennai. The major issue highlighted within these pilot interviews was the difficulty of access to the different stakeholders within the platform ecosystem. At this point, it was clear that recruitment of workers for research interviews was quite an achievable goal, but access at that point to platform and related technology companies as a PhD student studying surveillance was a difficult proposition. So, the research was reframed centring workers' experience.

4.4.1. Phase 1

From January to March 2019, I undertook the first phase of my fieldwork. I conducted a total of 36 interviews. The recruitment was done using snowball or referral sampling (Saunders et al. 2016). I first approached leaders of NGOs who support domestic workers (who were all women). Through this interaction, I was introduced to domestic worker leaders of self-help groups. I was then invited to two different meetings of the domestic workers. These happened in a community meeting space within

their area of residence and work. Here I set the stage for future interviews done as individual follow-ups.

During the recruitment of the domestic workers, a particular problem that came up was that some of the initially contacted workers did not use digital platforms to find work; that is, they did not resort to online advertisements. They still used word-of-mouth referrals to seek informal job opportunities within their social contacts. Even these workers were enrolled in Aadhaar, the digital identity platform. So, in order to capture the workers' experience on and off digital platforms and the variation of digital identity use, my sampling strategy included workers with and without online recruitment engagement with 'blue collar' job portals.

Phase 1 : January 2019 to March 2019

Domestic workers group and NGO leaders

Code	Length	Date
DWN1	35 mins	January 2019
DWN2	~30 mins	March 2019
DWL1	~2 hours	January & February 2019

Domestic workers without online recruitment engagement

Code	Length	Date
DWA1	27 mins	January 2019
DWA2	41 mins	January 2019
DWA3	~30 mins	January 2019
DWA4	41 mins	January 2019
DWA5	43 mins	February 2019
DWA6	~30 mins	March 2019
DWA7	25 mins	March 2019
DWA8	~1 hour	January & February 2019

Domestic workers with online recruitment engagement

Code	Length	Date
DWB1	~30 mins	January 2019
DWB2	35 mins	January 2019
DWB3	~30 mins	January 2019
DWB4	37 mins	February 2019
DWB5	~30 mins	February 2019
DWB6	24 mins	March 2019
DWB7	~30 mins	March 2019
DWB8	30 mins	March 2019

Cab-drivers union leaders

Code	Length	Date
CDL1	~2 hours 30 mins	Multiple meetings - January - March 2019, again in December 2019 and over phone in April 2020.
CDL2	~2 hours	Multiple meetings - January - March 2019, and again in December 2019

Cab-drivers using ride-hailing apps

Code	Length	Date
CDA 1	~45 mins	January 2019
CDA 2	37 mins	January 2019
CDA 3	57 mins	January 2019
CDA 4	35 mins	February 2019
CDA 5	~30 mins	February 2019
CDA 6	~30 mins	February 2019
CDA 7	58 mins	February 2019
CDA 8	~45 mins	February 2019
CDA 9	50 mins	February 2019
CDA 10	~45 mins	February 2019
CDA 11	55 mins	March 2019
CDA 12	35 mins	March 2019
CDA 13	~30 mins	March 2019
CDA 14	1 hour 10 mins	January & February 2019
CDA 15	~2 hours 15 mins	January & February 2019

Table 4.3: List of interviews in Pilot and Phase 1 data collection

The approach taken to recruit cab-drivers under ride-hailing apps was similar, where I approached a leader of a nascent labour union. Using his referral, I recruited other cab-drivers. I was also invited to attend the planning meeting of the union, which was conducted in a public park. I spent 5 hours interacting and observing drivers at the meeting and also conducting one-on-one interviews on that day. There were two protest events organised by the union members with the wider cab-driver community. They were mainly protesting unfair treatment and falling income within their work with ride-hailing platforms of Ola and Uber. I attended both these protests as an observer. Most interviews with the drivers were done on the road in between their trips, either within their cabs or in a public space like parks and the beach.

Building on my learnings from fieldwork during phase 1, I identified the gap that, as a researcher, I was missing - the context of actual app use among the workers. To a certain extent, this gap was bridged by narratives provided by the cab-drivers as gig-workers during interviews, in which they provided detailed accounts, showed the apps in action and even shared screenshots when describing their experience of use (see figure 4.2). But I wanted to explore deeper the algorithmic and data-driven contexts of gig-work. With respect to the digital recruitment platforms, I applied as a potential worker and engaged as a customer to look at the data policies and online practices. With the ride-hailing apps, I was able to observe the platforms' data practices, their governing policies and their apps as a customer. But the experience of gig-workers – who had a different app, was not translatable directly to customers. This informed the approach for fieldwork during phase 2, where I identified a clear need and opportunity for auto-ethnographic research as a gig-worker.

4.4.2. Phase 2

During phase 2 of my fieldwork, I had an opportunity to apply for funding to undertake a micro-project of 3 months. I designed the research in this to bridge the gap of access to direct workers' experience of gig-work apps. As I was not professionally a cab-driver and as the barrier to entry into this mode of work was very high – due to licensing and car leasing as pre-requisites, I chose to undertake a direct study of food-delivery apps. So, after a detailed and complex ethical review process, I was cleared to do my phase 2 fieldwork between December 2019 to February 2020.

Phase 2 : December 2019 to February 2020

Food delivery workers in platform A		
Code	Length	Date
FDA1	2 hours 15 mins	Multiple meetings - December 2019 - February 2020 and over phone in April 2020.
FDA2	1 hour 35 mins	Multiple meetings - December 2019 - February 2020
FDA3	~45 mins	December 2019
FDA4	31 mins	December 2019
FDA5	27 mins	December 2019
FDA6	25 mins	December 2019
FDA7	1 hour 10 mins	January 2020
FDA8	33 mins	January 2020
FDA9	~45 mins	January 2020
FDA10	55 mins	January 2020
FDA11	~30 mins	January 2020
FDA12	37 mins	January 2020
FDA13	2 hour 23 mins	Multiple meetings - December 2019 - February 2020

Food delivery workers in platform B		
Code	Length	Date
FDB1	36 mins	December 2019
FDB2	24 mins	December 2019
FDB3	~ 30 mins	December 2019
FDB4	58 mins	January 2020
FDB5	27 mins	January 2020
FDB6	~45 mins	January 2020
FDB7	22 mins	January 2020
FDB8	~ 30 mins	January 2020
FDB9	25 mins	January 2020
FDB10	~30 mins	February 2020

Food delivery workers in platform C		
Code	Length	Date
FDC1	~1 hour 30 mins	Multiple meetings - December 2019 - February 2020
FDC2	32 mins	January 2020
FDC3	23 mins	January 2020
FDC4	~30 mins	February 2020

Table 4.4: List of interviews in Phase 2 data collection

My design for auto-ethnography aimed at capturing the experience of informal workers as they seek to enter the platform ecosystem as gig-workers and during their work within the ecosystem on digital platform apps. Consequently, I began with my own enrolment into Aadhaar as the digital identity platform. Next, I undertook the necessary linkages of Aadhaar to other services that are needed for gig-workers. These included linking of Aadhaar to PAN card (for income tax), to bank accounts (for opening a bank account and for registering UPI based digital payments), to scooter's vehicle registration (for daily work as food delivery worker) and in submitting Aadhaar as a documentary copy to gig-work platform companies.

At this point, I visited recruitment and support offices of the major food delivery apps, namely Uber Eats, Swiggy and Zomato. I was able to join successfully in one of them with training and enrolment into gig-work conducted in the platform's office. On another platform, I had to seek enrolment through a 'middle-man'. I, as a potential gig-worker, was expected to be pre-screened by this individual (and this was also observed as a common practice mentioned by other workers). Potential workers are to send photos of all documents, including Aadhaar, personal information and bank account details using Whatsapp – without even having to meet the middle-man. This individual created an account on behalf of me as a gig-worker and provided the username and password over phone. Acting as a tout, he even expected to retain control of this information. Once this has been done, I as a 'pre-screened' gig-worker, visited the offices of the platform company. By mentioning the

name of the tout, I was fast-tracked into gig-work employment rather than undergo training and filling up of forms as done by other workers. The training videos were sent to me by the tout to be looked at later in my own time. He also introduced me over the phone to a local worker who 'trains' new gig-workers by taking them on their first gig run.

Parallel to the auto-ethnography, I also recruited food-delivery workers from all 3 of the major companies for my interviews/participating in my research. Overall, I interviewed 27 food delivery workers. This was done again through snowball sampling. Based on initial observation, I identified spots on the roadside where many of the food-delivery workers rested in between their gig runs. I approached them and, through repeated meetings and multiple contacts, built trust enough to engage a number of workers in the interview process.

My interaction as part of auto-ethnography with workers also happened at and near restaurants, and other food pick up locations, at platform support offices and by the roadside. As Indian gig-workers are expected to wear clearly visible uniforms and bags with company branding, this became an automatic marker of my belonging to the fraternity. This way, I was able to quickly become an 'insider' in gig-workers' workspaces. In these, I treated the interactions as observations rather than interviews as I engaged with them organically during gig-work as any other worker would do. I further visited two strike action and protest meetings as a researcher (not as a worker), where I was able to interact and observe other workers. Further observations were done over two Whatsapp groups, one of which was mandated by the platform company to manage local riders, and the other group was set up organically by local food delivery workers. This formed further observational data that qualified the contexts of workers' experience alongside my own auto-ethnographic work. Examples of these interactions and data are shown in the figures below (4.2).

My own food delivery efforts within gig-work were directed at exploring as many scenarios of work within the platform ecosystem as possible. The work was driven by 'orders' which entailed picking up food from a restaurant and delivering it to a customer address. I aimed to achieve gig-work targets only in a few days and sessions, as not hitting targets and points of failures where I did not complete orders were also of interest. For instance, a long-distance order I had to cancel resulted in a follow-up process instituted by the platform company. This provided me with a valuable interaction with another food delivery worker who acted as an issue fixer (who in fact, was the same person who 'trained' me on my first day). Such interactions formed critical exceptional situations to be captured as observational data.

As part of recording data during auto-ethnography, I used photos (see figure 4.1 for some examples), videos, and audio at key points when I deemed it necessary to add context to my own

observations. This was also enhanced with the end of day field notes and *ad hoc* audio recording as a memo to self to capture thought and observations during gig-work on the road. This, along with my written notes, informed me of my overall movements and interactions. This was supported by digital data generated by screenshots and screengrab videos taken at as many feasible points as possible to capture the different kinds of interaction I had with the platform apps. This was done as a form of self-tracking to capture my spatial movements and the prompts for timed schedules that I followed during the food delivery processes of order acceptance, food pickup, delivery and even during the wait for the next order (see figure 4.2). I also used data scrapping through optical character recognition software that isolated textual data on the order information, time taken and GPS locations from apps screens for later use. My movements were also continuously tracked by GPS functions on my smartphone – on Google maps and a specific GPS tracking app as a backup.

I further built a custom app using a free prototyping service called 'Clappia'. This mobile app helped to capture auto-ethnographic notetaking and mirror some data points that are only momentarily seen by me as a worker during the food delivery process. For instance, ratings given to the restaurant or customer asked of me as a worker is not available later to be revisited. I needed a way to capture my notes about this during the work session. These notes were not always recorded for each gig-work task – but was used to capture field notes. When I put together all of these disparate pieces of data, I was able to construct for myself my total work session, which formed the context for the bulk of qualitative data collected.

Figure 4.1: Moments during field-work
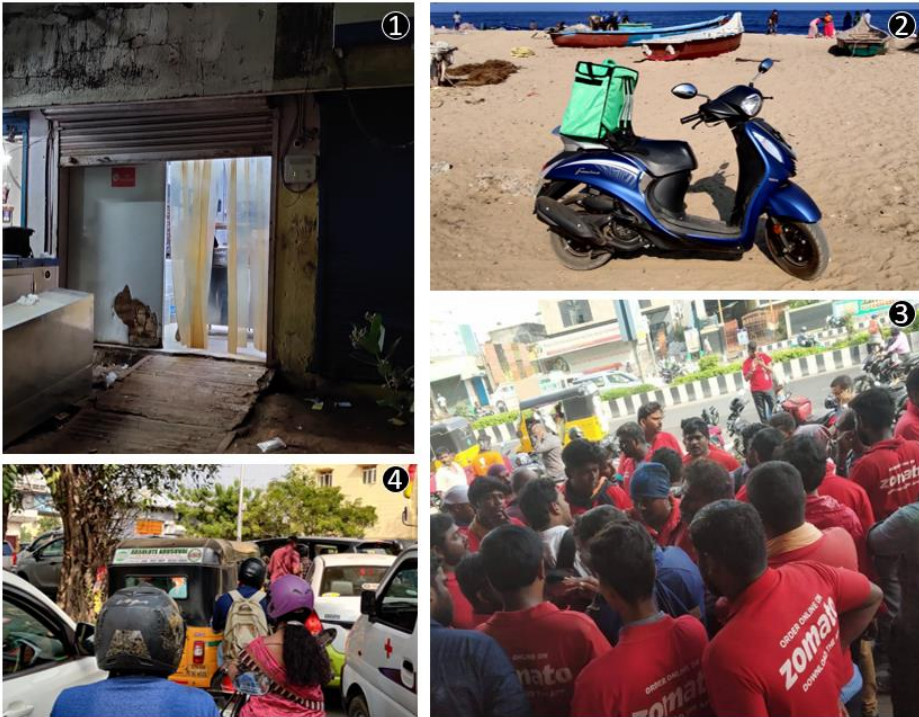
From left top clockwise:

1. A nondescript multi-restaurant kitchen, with a single kitchen-crew servicing 4 listed 'restaurants'. With no on-street or on-map information this location was very difficult to identify. Establishments like this trade solely on food delivery gig-work platforms.

2. My trusted steed. The scooter used for delivery work with the bag purchased from the platform company.

3. A scene from the local strike when workers did not log-in to gig-work apps protesting the changes in income structures.

4. A typical scene of traffic I negotiated while enroute to deliver food.

From bottom left to right:

5. Waiting for my first order to be assigned.

6. Queue of scooters of food delivery gig-workers waiting for their orders to be fulfilled by the takeaway establishment.

7. An example of delivering packaged hot tea during peak afternoon 'snack time' window.
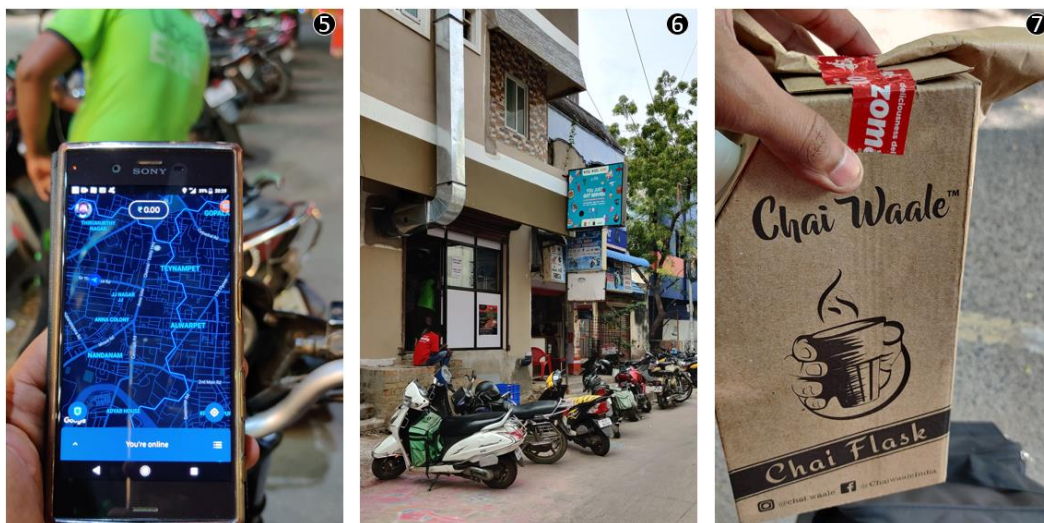
Figure 4.2: Screenshots of apps used during research
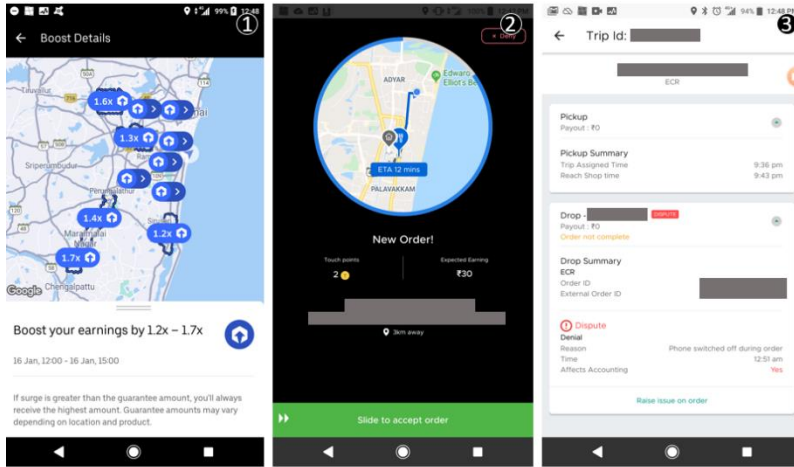
From left to right:

These three screenshots of food delivery gig-work app shows various stages of the work process.

1. Shows the boost multiplies applied in different spatial zones in Chennai during the peak lunch time window.

2. Being alerted for an incoming food pick up task which is time-limited.

3. An example of a 'disputed' food delivery order when I switched off my phone to avoid the work.
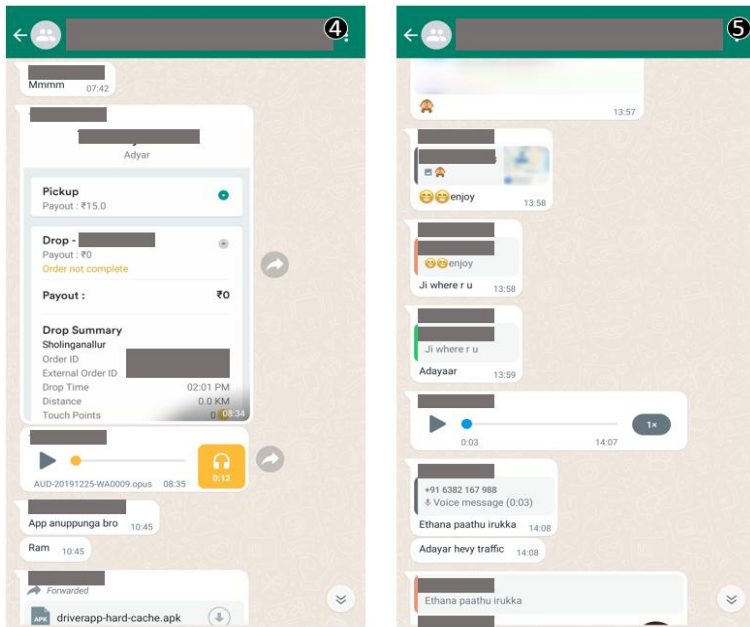
From left to right:

These two screenshots show ongoing interactions within gig-worker Whatsapp groups which I was a part of.

4. A worker is warning other workers using screenshot of apps and voice note that the restaurant has a 'fire' incident and so the gig-workers have to call customers and inform to cancel their orders.

5. Social interaction between gig-workers discussing their progress to target in that day and advising each other about traffic on the roads.
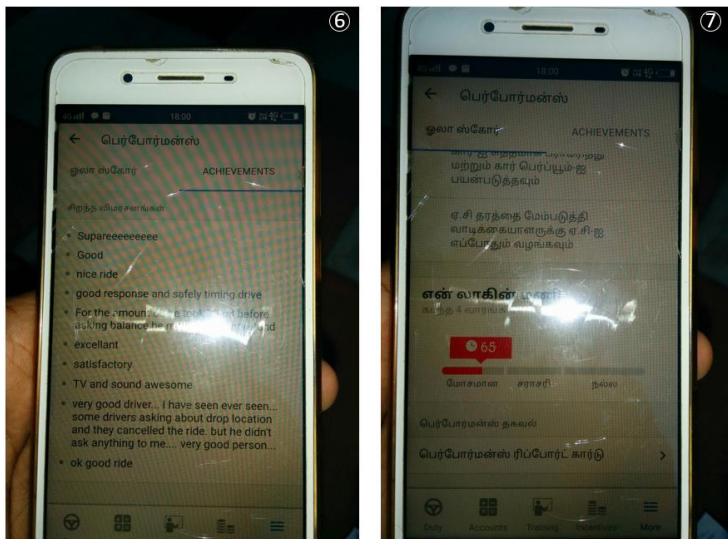
From left to right:

These two screenshots were provided by cab-drivers showing the performance screens.

6. Shows comments left by customers but in English which the driver cannot read.

7. Other screens in the cab-driver's gig-work app are in Tamil showing login time measured as a metric.

4.5. Ethical consideration

There were specific ethical issues to be considered for this research. During research design and the actual data collection, I specifically sought out options to mitigate the issue identified here. These issues emanate across both governmental and private contexts, which this research straddles. Within the governmental context of Aadhaar being a unique identity, data-protection was of high priority so as to not adversely impact any of the participants by revealing their personal details. Equally within gig-work contexts, protection of the workers from being identified by the platform companies was the main issue. Particularly within the auto-ethnographic context of my work as a food delivery worker, I needed to acknowledge and mitigate personal risks. The below sections describe these contexts and mitigation measures undertaken.

4.5.1. Data-Protection and Anonymity

Given the nature of the research, I engaged in in-depth interaction and data collection directly with mainly marginalised individuals as research subjects. The main risk was the multiple points of personal details of an identifiable nature that was collected for such a reason. Beyond contact and demographic details, the specific empirical context also means that documentation like Aadhaar or other identity cards and digital artefacts like digital platform app profiles were usually brought up during the interviews. The interaction as a source of qualitative data was used directly for specific research purposes only. But any other aspects like personal data that identifies the participant was not presented publicly in any form. Further, given the nature of research involving identity cards, Aadhaar numbers or gig-work profile identity artefacts, a diligent effort was taken that none of the captured images, audio or textual data replicated any of the sensitive identity information

Going by data-protection best practice, all this collected data is referred to in the papers and the thesis with anonymity intact and using coded names. I, as a researcher, have retained confidentiality of the discussions such that no interview subject is identifiable. Specifically, since my research is set in India and is on surveillance and risks related to data, I reflected on the issue of operating under the lack of a comprehensive data protection framework. In the research process, in following an ethical standard of data protection, I took cues from both Royal Holloway, University of London's own ethical guidelines, and used further recommendations to look at ethical research codes from organisations like Economics and Social Research Council (ESRC), and finally from legal frameworks such as General Data Protection Regulation (GDPR) active within Europe. Under such a data-protection paradigm, the collected data like audio, video, photo and text will not be kept longer than necessary and will be promptly retired once its utility has run out. The storage of all this data is in a secure location, only duplicated under a password protected hard-drive and stored securely.

4.5.2. Personal Risk and Positionality

Given the adoption of auto-ethnography as a method, my own positionality became both a point of ethical consideration and of personal risk. Specifically, I began by acknowledging my own location within the 'insider/outsider' spectrum in undertaking this research. This presented me with three specific points to consider the relationship between my role as a researcher and my research participants. First, in conducting interpretive research with auto-ethnographic data, I was conscious of my power to represent my own view over the voice of marginalised workers. Here I have made sure that the representative 'voice' in the research output is objectively faithful to the interview subjects, and my own personal experience is relegated to only a contextual role. This also related to the second issue of my positionality within the Indian society (education, caste and gender as main factors).

Given the position of socio-economic advantage I hold within the field site of Chennai, I was under no illusion of my own role. I did not set out to replicate issues of marginalisation and precarity during my time riding as a food delivery worker. It was merely to observe that which is opaque during research on platforms: algorithms and data. Finally, given my cultural connection to my location of research, I reflected on issues of bias from overidentification, empathising and loss of objectivity (Glesne 2016). This was the other end of the spectrum – on the issue of over-representing the voice of the workers and losing sight of other contextual issues. I reflected on my objectivity by balancing workers' viewpoints and my own experience with wider contextual research.

Further ethical complexity was the personal risk that I bore in undertaking auto-ethnography and the risk that I passed on to the workers I engaged with closely. I took direct mitigation to address this risk through a detailed ethical review and approval. As part of this research approval process, the auto-ethnography phase of data collection underwent a 'fieldwork risk assessment'. Here I considered risks such as physical hazards and personal safety while working on the road as a gig-worker and ways to mitigate these. This involved the issue of handling hot food and riding a scooter, and negotiating potential rainy days. Additionally, a legal risk was also highlighted in my research potentially attracting negative attention from the platform companies.

A way to mitigate legal risk was the anonymisation of the companies in my writing. This also protected the workers who participated in my research. Moreover, the choice was to undertake a covert auto-ethnography as informing the food delivery company would invoke possible undue influence, either negative or positive, made on me as a researcher or the other research participants by the company. A further step in achieving this was to mask any related data such as location or area names, restaurant names and anonymising anything identifiable. This was a necessity as gig-work

companies have detailed surveillant capabilities that can be used to track using very minimal data and identify individuals if there was an intent of such action.

4.5.3. Informed Consent

All data collected for this research has been done after full disclosure of intent established, and after consent from the interview subject has been collected and duly recorded. An information sheet and a consent sheet were prepared and used during the interaction to showcase the aims of the project. I, as a researcher, briefed the participants orally, detailing research expectations and the scope of their participation and consent was recorded. Here all participation was voluntary, and no one was pressured into engaging with me as a researcher. The information sheet is replicated in the appendix (9.1) from phase 2 of the fieldwork. This was also translated into Tamil. But the cultural resistance to giving anything in writing meant that most of the consent was given vocally and recorded by me with the participant's confirmation.

4.6. Data Analysis

In this research, the data analysis was done using a combination of deductive and inductive approaches. This entails an iterative reading of theory and examination of data. Taking a combined deductive and inductive approach places a premium on the reflexive position of the researcher. It supports a broad scope for theorisation and a sophisticated theoretical framework that guides both data collection and analysis. This flexibility means that any unfamiliar observation made during data collection can be accommodated by the researcher being 'sensitised' by a prior theoretical understanding of the subject. The use of theory as a sensitising device has been a long tradition in information systems research and in conducting interpretive field studies. (Klein & Myers 1999, Flynn & Gregory 2004).

Compared to an inductive approach usually in use within qualitative research, a middle ground of a combined deductive and inductive approach allows for seeking a deeper understanding of the empirical context alongside efforts to modify and extend theories. To begin such an analysis in-depth engagement with existing theorisation is a necessity. In this thesis, other than the literature review, I synthesised an overall theoretical framework. This set the stage for my preliminary understanding of both surveillance and inclusion as constructs. Operationally this initial reading was helpful as the data collection involved two phases. The overall thesis too was written as three papers with corresponding iterative engagements with the data. As my knowledge of the field increased, I went back to theory to seek explanations of any observed newer phenomenon.

Methodologically, the combined deductive and inductive approach used here is supported by template analysis and helps sort through the data in this thesis. Template analysis as a technique involves attributing hierarchical themes and codes structured as an analytic template from a previous reading of literature and using this to guide the coding of data (Cassell & Bishop 2019, King & Brooks 2017). The case study strategy used in this thesis fits well with the use of template analysis (Waring & Wainwright 2008). This approach allows for *a priori* themes from an initial analysis of data, supported by theory. The development of an analytic template was also very relevant in this thesis to systematically organise the whole dataset that emerged across two phases of data collection. This helped in defining the guiding concepts of the thesis, such as surveillance, social justice and inclusion, in a way that was coherent across the three papers. This was made possible by individual templates informed by data and theory comparable across the papers to understand an overall view of the research.

The *a priori* themes and codes initially developed under template analysis can evolve to form a final template, which then can be used to describe or analyse the underlying researched phenomenon. For qualitative enquiry, template analysis fits well within the interpretivist framing of the research. However, as it has been used here, the initial template only presented the broad patterns rather than a deeper analysis of interactions and relationships (King 2012). As seen in the analysis presented within the papers, detailed analysis that explored theoretical concepts within the multiple empirical settings was done by iterative coding. This is detailed by template analysis as a method. The initial template derives from a familiarisation of the data and theory, which further helps in defining clusters of code. This, in turn, contributes to the evolution of templates through an iterative coding of the data.

Within specific papers, certain themes were prioritised as is allowed under the template analysis logic (King & Brooks 2017). This also allowed the analysis to dip in and out of the varying contexts of the papers while still remaining structured in a way that worked for the totality of the thesis. The coding then moved from being descriptive to progressively interpretive, remaining true to the multiple levels of interpretation as has been discussed earlier in this chapter. Short forms of codes were used during the analysis phase, and some of these were logically combined. In the tables below and as shown in the appendix, their explanatory long-form is presented. As the analysis progressed, data was revisited multiple times until a logical saturation was reached and a final template emerged. This then directed the interpretive writing up of the findings and in contributing to theorisation

4.6.1. Paper 1

During the first phase of data collection used in paper 1 (Krishna 2021), the template began with initial themes defined by the abnormal justice framework of cultural, economic and political/procedural dimensions. As the analysis progressed, categories and sub-themes emerged by a grouping of similar codes. This provides a more detailed template that brought out a nuanced meaning of social justice, as discussed in the paper. For instance, multiple interviews include questioning on why they chose to enrol into Aadhaar and what benefit they expected. The answers present multiple reasons, including the need for proof of address, getting a legally approved identity card, and even claiming their right as a citizen. Further coding helped surface the data generative nature of Aadhaar as specific contexts were explored. Using a surveillance view on Aadhaar and seeking out how the data is verified by the identity helped in this. This was connected to the theoretical reading of social justice and recognition as a component within it. A similar analysis also identified multiple stakeholders using a social justice framing. Particularly, multiple mentions of trust emerged between workers, customers and how platforms were involved in mediating this.

1. Cultural recognition
1.1 Seeking individual recognition
1.1.1 Obtaining formal/legal inclusion
• Workers seeking documentary proof of identity • Satisfying formal identity needs (bank, subsidy etc) • Workers seeking legitimacy of their role
1.1.2 Governmental and private context overlaps
• Blurring of mandatory vs voluntary (during onboarding into platforms) • Online verification of Aadhaar identity (under UIDAI)
1.1.3 Establishing/demonstrating identity
• Seeking membership to union/group • Aadhaar as informal proof of identity • Platform proof of employment/contract
1.2 Lack of trust among stakeholders
• Recruiters expect Aadhaar for 'blue-collar' jobs • Absence of formal mechanism for workers knowing employers/customers • Issue of customer and worker safety
2. Economic redistribution
2.1 Monetisation practices
• Monetisation of worker personal data (by targeted ads and services) • Workers coaxed into using platform specific digital payment (wallets and other offers)
2.2 Digital Financial Ex/inclusion

2.2.1 Cashlessness as inclusion
• Cash on delivery pushed by platforms as convenience for customers • Cash needs regular deposits into platform bank account • Limited digital payment use outside platforms
2.2.2 Income and financial uncertainty
• Increasing platform commission and changes in its calculation • Continuous fall in income levels for workers • Regular cash crunch for gig-workers
2.2.3 Adoption of digital payments
• UPI presented as an ease of use for workers • Demonetisation shock pushed digital payment adoption • Multiple changes in digital payment options
3. Political / Procedural representation
3.1 Issues in redressal processes
• Consent routinely signed without workers getting clear information • Secret OTP regularly expected to be shared (within platforms practice) • Virtual ID solution made online only
3.2 Language and literacy issues
• Risk of intermediary involvement in onboarding gig-workers • Consent/contract terms presented in English • Aadhaar public service kiosk (availability and cost issues)

Table 4.5: Themes, sub-themes and codes for Paper 1

4.6.2. Paper 2

While the first paper of this thesis (Krishna 2021) was restricted to understanding the role of Aadhaar, the context of gig-workers was a logical extension of the scope of the analysis and the research. This signalled further complexity in how data generated on and by the workers is used within the wider ecosystem. This led to phase 2 of data collection and to the second paper in this thesis (Krishna 2020). I chose essentially to 'follow the data' - in both the sense of my own research's data and of the data generated within the gig-economy. Analysis began with justice as a basic construct explored across a rubric of stakeholders. This was also informed by a typical gig-work food delivery cycle that was observed during my auto-ethnography work. Typically, the gig-worker faces digital and app-based work, physical and on-road work and encounters restaurants and customers in platform mediated interaction. This was used as an initial template to capture the entirety of a food delivery experience.

At this point, informed by a previous reading of literature and field experience, a daily engagement with issues of space and time emerged. Responding to this – data was grouped around the issue of space and time, resulting in the deepening of the analytic template. The construct of 'spatiotemporal justice' was then the direct outcome of such an analysis. Three major thematic issues

coalesced from the data and signalled the theme of inequality performed spatiotemporally between stakeholders within a platform context. In this paper, visual data collected during autoethnography was used to support the analysis and contributed to developing further the analytic templates.

1. Trade-off between space and time
1.1 App design issues
• Over use of haptic actions/alerts and alarms defining multiple tasks • Speedy actions expected and push for quick decision by workers
1.1 Platform targets and metrics
• Combinatorial targets of time and distance • Diminishing income as daily/weekly targets progress • Disqualification conditions erases progress towards targets
1.2 Spatial / temporal balancing act
• Location or address hidden forcing workers to accept work • Tightly timed actions undertaken while riding on road • Actions defined by workers location on apps
2. Gig-work digital representations
2.1 Issues in digital representation
• Longer distance driven/time taken to accommodate issues by platform or customer • Location mapping issues faced by customers passed on to workers • Workers regularly seek advice over Whatsapp (on errors)
2.2 Knowledge production by workers
• Cultural and local knowledge of workers in use of restaurants, food and locations • Workers negotiation of local routes and traffic incrementally captured by platform • Workers train other workers informally
2.3 Platform control of productivity
• Algorithmic prediction of delivery and driving time • Frequent and complex changes in income calculation • Multi/batch order lowers income per delivery made
2.4 Platform imposed behaviours
• Platform impose congregation near busy restaurants • Absence of worker control on route and location data
2.5 Material and physical working conditions
• Additional risk on road (such as rain or hot sun not accounted for) • Traffic conditions during peak hours (not accounted for)
3. Customer-worker asymmetry
3.1 Asymmetrical surveillance practices
• Continuous visibility of workers to the customers • Tips and incentives are linked to 'best' rating given by customers • Ratings of customers done by workers not making a difference • Workers lack information on restaurants or customers

3.2 Unpaid labour and data production
• Parcelling food at restaurants in most orders during peak time • Workers act to provide customer service and resolve issues

Table 4.6: Themes, sub-themes and codes for Paper 2

4.6.3. Paper 3

The third paper in the thesis builds on both phases of data collection and the previous analysis done in the other papers (Krishna 2020 & 2021). The analysis in this paper mainly acknowledges the roles of surveillance and datafication. Based on readings of liquid surveillance, the paper extended context to the level of the platform ecosystem and explored how inclusion is experienced within it. This formed the initial template within which data related to food delivery workers and cab-drivers were queried. Many parts of the older data were revisited, and newer insights were sought under the framing of 'inclusion'. The findings led to the construct of 'liquid inclusion' being performed in 3 forms: of financial inclusion, of seeking identity legally and digitally, and of aiming for formal and stable employment. Data grouped under this led to a detailed template that shows how the performance of datafication affects the specific pathways to inclusion. The extension of the template allowed the probing of interrelated contexts where financial data, personal identity data and employment data all have varying impacts.

1. Datafication of identity
1.1 Data aggregation by platforms
• Absence of consent in sharing data (initial years) • Database of personal records for 'blue collar' workers across the ecosystem
1.2 Self-surveillance practices
• Platforms push to submit Aadhaar as mandatory during onboarding/registration • Time limited OTP based verification for each transaction • Regular KYC process for multiple services
1.3 Sharing personal data
• Paper use of Aadhaar to verify and submit personal information • Verification of personal data shared across systems/platforms
2. Profiling and sharing of financial data
2.1 Creation of worker financial data profile
• Eligibility for private services calculated based on gig-work profile • Incremental data forming an income history
2.2 Marketing of credit to workers
• Gig platform marketing loans as benefits during onboarding • Personal loans and vehicle loans linked directly to gig-work platforms

3. Gig-work as formalisation
3.1 Data sharing across platforms
• Government portal registration under Aadhaar • Portability tracking for workers moving across platforms • Demographic data sharing across government portal (eShram)
3.2 Gig-workers welfare opportunities
• Aadhaar as eligibility criteria for availing governmental welfare • Platform and government imposed definition of 'gig-work' productivity for welfare eligibility • Gig-work positioned by national digital strategy as formalisation

Table 4.7: Themes, sub-themes and codes for Paper 3

5. RESEARCH PAPERS

5.1. Paper 1: Digital Identity, Datafication and Social Justice: Understanding Aadhaar use among informal workers in south India

Krishna, S. (2020). Spatiotemporal (In) justice in Digital Platforms: An Analysis of Food-Delivery Platforms in South India. *Proceedings of IFIP Joint Working Conference on the Future of Digital Work: The Challenge of Inequality (pp. 132-147). Springer, Cham*. https://link.springer.com/chapter/10.1007/978-3-030-64697-4_11

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Digital identity, datafication and social justice: understanding Aadhaar use among informal workers in south India

Shyam Krishna

Digital Identity, Datafication and Social Justice: Understanding Aadhaar use among informal workers in south India

1. Abstract

Aadhaar – is India's national biometric digital identity programme which aims to provide a unique 12-digit number for every Indian resident. Using this identity, the programs enables digital linkage to key governmental and non-governmental services. Through this Aadhaar seeks to achieve digital financial inclusion of groups like marginalised informal workers into the mainstream economy. This paper focuses on experiences of such informal worker groups - of cab-drivers and domestic workers in a south Indian city, who use Aadhaar as an identity for verification. Using Aadhaar verified data these workers access digital platforms of online recruitment portals and gig-economy apps which are aimed at employment of urban 'blue collar' workers.

The paper contributes a novel theoretical lens to the literature on 'data justice' and more broadly to ICT4D research. It operationalises 'abnormal justice' using as a framework the cultural, economic and political dimensions of justice synergistic with elements of surveillance and datafication inherent to digital identification. The paper presents critical findings on digital identity use and the dataflows it enables using empirical evidence of semi-structured interviews and field observations. It is found that 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 exploits the new-found digital participation of the marginalised to create further economic inequalities; and unfair and complex barriers continue to exist for the marginalised using digital identity to voice 'informed consent' or to access redressals to security issues.

2. Introduction

The need for digital identity has been brough to focus in the last decade with many prominent national level efforts across the globe. The United Nations' Sustainable Development Goals adopted in 2015 has inspired many digital identity programs. These focus on 'inclusion' and 'inclusive societies' with a target to 'provide legal identity for all' by 2030 (UN 2018). On the back of such ambitious targets

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). These national identity infrastructures have attracted competing viewpoints in both popular and academic discourse. An emancipatory view places them as an empowering and inclusive technology within the global South context (Dahan & Gelb 2015). The counter narrative contends that such technologies bring routinisation of surveillance and an overreach by the state increasing the scope for abuse of power (Whitley & Hosein 2010). Further contextualising this argument is the observed dissonance that while 'rich' states have moved away from identity infrastructure, there is an increasing use of digital or biometric identity schemes in the global South (Bennett & Lyon 2013).

At the centre of a very similar set of arguments is Aadhaar – India's national biometric and digital identity programme. Aadhaar works using iris scans and fingerprints to uniquely identify individuals within a networked national database of residents. This database can be queried in various ways to authenticate an individual's identity and verify their demographic information while accessing public services or in private commercial settings (UIDAI n.d.). To deliver this, Aadhaar's architecture espouses advanced technical capabilities including the 'big data' paradigms of 'openness' to interoperability, 'scalability' to achieve high volumes of data and in using application programming interfaces (APIs) that enable bulk digital verification (Varma 2014, Viswanathan 2019, UIDAI n.d.). Consequently, Aadhaar functions at the core of a complex ecosystem where the digital identity verification is used by both governmental and commercial systems. This positions Aadhaar such that while biometric information itself is not shared beyond governmental database; verification processes makes sharing of data necessary to prove one's identity.

The focus of this paper is in querying the role of Aadhaar in enabling dataflows. At its core Aadhaar can be considered a massive effort towards the 'datafication' of the lives of Indian residents. Datafication transforms social actions or outcomes into data through quantification (Mayer-Schoenberger & Cukier 2013, Van Dijck 2014). The impact of identification is carried forward by the data-driven contexts of Aadhaar's use. By design Aadhaar is used across systems to verify both online and offline data generated about individuals based on a biometrically corroborated uniqueness of their identity. This means that even if the state does not collect vast quantities of data directly with a motive of surveillance, a move towards datafication creates 'verified' dataflows that cause diverse social impacts beyond the original intention for which data was collected.

From a research perspective the use of Aadhaar for verification is under theorised. A knowledge gap exists in understanding the complex impacts of surveillance and datafication on those at the margins. Those who lack proper documentation seek Aadhaar as a state mandated identity. But

due to datafication amid regulatory void and lack of data protection legislation, their new-found digital participation under Aadhaar potentially makes them vulnerable to risks due to unethical use of data. With digital identification providing a more efficient means to acquire and store data, the impact and ethics surrounding these technological practices come into question. Already there are disputed practices highlighted under the Aadhaar regime. These issues include the unaccountable deletion of data records related to welfare by the state, and the overarching absence of a consent process in how data is stored and transferred across multiple interrelated systems (The Wire 2017). On top of this, vulnerable population undergo verification for private sector uses using Aadhaar as a proof of identity. Moreover, even when the state seeks to address such concerns due to factors like absence of data-literacy or inadequate awareness about data protection the solutions do not always help the marginalised communities (Abraham et al. 2017, Abraham et al. 2018, ET 2018a). The consequences of such practices of datafication under Aadhaar is underexplored in research. This paper queries the use of digital identity that enables participation of marginalised groups in a digitally connected society, contextualised by the possible challenges that arise in the realm of ethics, fairness or inequality.

By encapsulating the impacts of digital identity under a lens of 'social justice' this paper places Aadhaar within the datafication and surveillance experiences of the marginalised population. This is achieved by studying the daily-life experiences of informal workers in south India in using Aadhaar as a means of verification to gain access to other digital platforms that provide employment. The research question that this paper ultimately answers can be presented as: *What is the social justice impact of 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 this a description of the case study background, the research methods and the empirical findings are presented. Finally, the paper concludes with a discussion on the wider implications of the findings presented.

3. 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 and used in later sections for the analysis of the case study under focus.

3.1. Surveillance, datafication and justice

The global growth in use of digital and biometric infrastructure pose many concerns on their reach and the breadth of their impact. Strong identification systems, reliable databases, and the surveillant visibility of the citizen to the state are in fact considered a necessity for governments - to identify, manage and provide services and welfare to its citizens (Breckenridge 2014, Diop 2017). The socio-economically disadvantaged population have a further issue of falling into what Gilman & Green (2018) have called the 'surveillance gap' – the 'systemic invisibility' of certain classes within society. To solve this invisibility at the margins of the society, global South governments have embarked upon large scale identification programmes. These programs raise concerns on their potential negative impact even as there is a clear necessity for digital identities.

Efforts such as ID4D (Identity for Development) argue that that achieving inclusion of underserved populations and increasing efficiency of governance is possible by well managed digital identity programs (World Bank 2016). But research points to risks of surveillance and negative impact of datafication. As Whitley & Hosein (2010) argue identity programs that have multi-purpose design and an open-ended agenda can end up enabling dataflow between state and private entities. These issues become potential pathways to data-led discrimination and breach of ethics within global South contexts where data-protection frameworks are absent. Prevailing scholarship identifies that datafication efforts in global South are biased towards a narrative of positive impact for the poorer vulnerable communities (Arora 2016). But a counternarrative has emerged particularly on how datafication when mandated by the state can affect the vulnerable communities negatively exacerbating societal inequality (Eubanks 2018).

Building on such arguments and setting the agenda for future scholarship in relation to surveillance, Marwick & boyd (2018) call for a theorisation that 'incorporates a wider set of harms and needs' of the marginalised to be understood in relation to their everyday practices. A similar argument is done by Gangadharan (2017) that being included in a datafied society means 'participation in the potentially harmful consequences'. They call for a need to widen the ambit of how aspects of surveillance are conceptualised. Prior research by Taylor & Broeders (2015) similarly call for theorisation and for a new ethical approach in understanding surveillance and datafication anchored in the Global South. Recent other scholarship has also acknowledged this as an area of concern calling for a 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, Eubanks 2018, Roth & Luczak-Roesch 2018).

The growing corpus of work on 'data justice' – including by Johnson (2014), Dencik et al. (2016), Heeks & Renken (2018), Dencik et al. (2019), Heeks & Shekar (2019) – brings together varying related strands of theorisation on datafication and surveillance, using a critical and an ethical lens. Mainly – as many of these research work presents 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 the 'complexity of what participation and incorporation into online worlds entail'. Echoing this, the section that follows conceptualises identification and datafication within surveillance theorisation to engage with social justice as a lens.

3.2. Theorising 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 studied 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 dataflows, mutating surveillance agencies and the targeting and sorting of everyone.
> (Lyon 2010: 325)

Technologically surveillance is then 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 (2008, 2009). The next section presents this as a framework within which the need for an identity is conceptualised as 'recognition' and is a key dimension of justice alongside other contextual social factors.

3.3. Abnormal justice as a framework

In theorising recognition, Bauman (2001) invokes Fraser (1998) to argue that recognition in society must be understood with its allied economic or distributive justice factors. Fraser (2000, 2008) presents these as the underlying dimensions of a complex idea of justice – presented 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). To further contextualise claims to justice, Fraser extended redistribution and recognition as dual dimensions of justice by adding a third dimension of 'representation'. She posited further that we live in an era of 'abnormal justice' as opposed to normal justice. 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 evidently not present and is sought. Under abnormal justice the three nodes are all up for contestation. The 'what' or the meaning of justice is then profoundly changed and is to be queried contextually. It is not just the fair distribution of resources, or merely achieving recognition in society. Here the 'what' is a wider conceptualisation of that which needs to overcome three societal injustices (Fraser 2008): misrecognition, maldistribution and misrepresentation. 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 abnormal justice as recognition and redistribution were proposed initially by Fraser (2000). Any 'misrecognition' results in an injustice of the cultural domain where respect or esteem is unequal due to embedded cultural hierarchies. Absence of recognition results in unequal social standing where some individuals or marginalised groups face barriers due to cultural markers such as gender, religion or caste. Similarly, 'maldistribution' is the unfair distribution of resources seen in the economic domain resulting in lowered income, unequal wealth, or inequality in

other intrinsically economic value markers between actors in society. For the digital identity context, recognition here zeroes in on the impetus to seek participation within society through surveillance mechanisms (Bauman 2001, Lyon 2016), and can be read in a way that is coherent with Fraser's (2000) argument. These digital identity artefacts and the data that they create become the sole means of recognition for the surveilled individuals. In many cases when these identities are made mandatory, those without identity can even be invisible to the state and within the wider society (Gilman & Green 2018). The provision of digital identity rendering its user visible is expected to help overcome extant cultural subordination and to attain social 'recognition' (Brighenti 2010, Lyon 2016). 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).

Fraser's (2000) work presented, an inevitable entwinement of the cultural and economic mode of participation - of recognition and redistribution. Since economic subordination in a society in many cases can cause cultural subordination and vice versa, Fraser (2000) deems that the cultural component of recognition of one's social position in the society is frequently paired with the seeking of fair 'redistribution' of resources – or 'distributive' justice. In the digital identity context, this translates into two things: a means of recognition of the identity of users within the society and an ease of economic participation by verifying that these users truly belong in the society. These in fact can be argued is the essence of digital identity programs worldwide (World Bank 2016).

For the proponents of digital identity program be it governments or commercial enterprise, the use of digital identity driven surveillance makes it possible for data to be collected about these user communities. Such surveillance, Cinnamon (2017) argues invoking Fraser (2008), ascribes varying economic value to users due to the differing recognition of their status in a data-driven society. The lower class that produces data relinquishes control of personal data and faces status inequality when direct economic value is derived from their data. The higher classes in the status hierarchy – those who can collect and analyse, make the surveillance data extractable for its economic value. This data can be directed towards financial ends not always necessarily to the benefit of the user of the digital identity – who is usually in the lower class with a higher class seeking to gain economic value in some way. In case of a profit-driven commercial enterprise, value is extracted from data of the users which become marketable assets. In case of a government, citizens data is used to improve governmental efficiency to create economic value, which can also even negatively affect the welfare or benefit of the citizens who provide the data. Moreover, the flow of such data is usually across both consumer and citizen arena bridging the individual's social belonging more pervasively as a combined factor of economic and cultural participation much as Fraser (2009) posits. This can be seen by the regular use

of credit and banking information by the state and governmental authorised identity information by the commercial sector.

Attaining social justice then within the use of digital identity hinges on this entwinement on two main aspects: the use of digital identity to recognise of the user's position within the society fairly, and by making sure that no unfair gains result from the economic impact of such usage and the dataflows enabled. Taking a cue from this, the two dimensions of recognition and redistribution can be employed to understand cultural and economic status subordination leading to and resulting from use of digital identity.

The third dimension seeks out fair political representation and equal voice in processes that define rules and make decisions within a society. Any 'misrepresentation' occurs in the political domain due to lack of political 'voice' in determining the rules of the society that individuals ultimately live under. This creates political voice-lessness, and unequal democratic or procedural access to participation. Fairness in procedural aspects like personal and institutional data-governance policies or practices can be conceptualised under this dimension. For instance, 'information disclosure' has been considered the 'voice' of users being heard by decision makers (Bier 1993). Similarly, a 'fair' means of giving voice and providing control of one's data is through procedures of 'informed consent' and options for 'opt-in' or 'opt-out' (Ashworth & Free 2006, Fuchs 2011). In contexts of the global south and within marginalised communities, the procedural fairness of practices such as informed consent needs to be queried. It is already acknowledged that most privacy and informed consent practices globally are approached through a 'western' and individualistic tenet of privacy as a right (Marwick & boyd 2014). This needs to be challenged as Srinivasan et al. (2018) argue by invoking Nissenbaum's (2011) advice to understand privacy contextually. Srinivasan et al. (2018) present that the agency to take decisions that govern privacy - such as on the management and sharing of data, is in fact not with the individuals among the marginalised communities anymore, but that this agency is shifted to institutional entities which control the digital networks enabling dataflows. Thus, for global South context nuances of fairness needs to be explored in the procedural aspects of informed consent, storage, use and sharing of data collected.

Taken as whole, the 'what' of justice or the meaning of justice that is sought then becomes a combination of: equal access to resources, equal social standing and fairness in procedures of governance. Thus, the core objective of justice or 'parity' as per Fraser (2008), would be achieved by overcoming the 'subordination' across cultural recognition, economic redistribution and political representation dimensions.

The other elements of abnormal justice help to contextualise the above understanding of justice. The second and third node of abnormal justice – the 'who' and 'how' of claiming justice can help the understanding of the impact of datafication. The 'who' here would refer to the stakeholders that can play part in and be subject to contestations of the justice. Consider the notion of 'data-class' based inequalities as presented by Manovich (2012) and Andrejevic (2014). In context of personal data, Manovich (2012) present division of the 'data-classes' the ones who create, collect data, and analyse data. Andrejevic (2014) related to this presents a class-based analysis of user-generation and collection of data based on a paradigm of user labour. But the 'who' of data justice based on the above discussion can extend the analytical categories beyond data production since the meaning of justice itself has been already extended by the first node of abnormal justice. 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.

The 'how' of justice is again procedural and this needs to be read as a meta-procedural issue in context of surveillance and datafication. The political dimension encapsulated the procedural aspects such as data-governance policies and practices. The 'how' here would define the procedural ability in which these can be questioned and contested as an aspect of justice. Here Nancy Fraser's conceptualisation of a 'frame' as the rules of participation across the three dimensions of justice comes into focus. The frame is politico-spatial which is to say a typification of a societal setting not necessarily limited by geographical boundaries. For the case of digital identity, it is the basic societal rules of participation in the society driven by needs for identification and dataflows. This in practice is a heterogeneous assemblage of laws, processes and technologies, which necessitate, enable and perform both identification and datafication.

The frame then becomes the boundary condition 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 digital platforms, this can be understood as being defined by the 'terms and conditions'. These terms can be dictated outside a 'normal' framework of justice – meaning the norms of governing and regulating digital platforms for aspects like data-protection does not always exist. This is particularly true in the global south where there is a potential for terms and conditions of a digital platform to be exploitative. If these exploitative terms are all that govern the user's interaction with the digital platform then this exempts the service providers from true 'democratic control' as Fraser (2010) argues. If the terms and condition of a digital platform is exploitative that can be questioned as being a political issue of voice-lessness as discussed earlier. But the 'how' deals with the mean in which the process of setting the 'terms and conditions',

its regulation and even its reason to exist can be contested. Does one claim for such an issue of justice to the platform themselves or a court? In many cases claims cannot be made to the courts or the government as a legal and regulation void can exist with respect to digital technology. It could also be that the actual practices of datafication are obfuscated due to high level of technological complexity, or by protected algorithms and design that hinder even the definition of the meaning of justice is in this context. So, the frame' which defines the rules of participation in the society is also implicated in the third node and can itself be questioned as being unjust. This complex political nature of justice particularly lends itself to study of datafication processes, the procedures, and the heavy involvement of non-state actors in digital infrastructures (Cinnamon 2017).

In summary, the conceptual framework (Figure 1) is used for analysis of the case study. The framework primarily adapts Fraser's (2008) core aspects of participation within 'abnormal justice' to formulate justice 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 unequal economic value creation, and 'misrepresentation' will deal with the loss of voice and procedural access of individuals under surveillance and datafication.
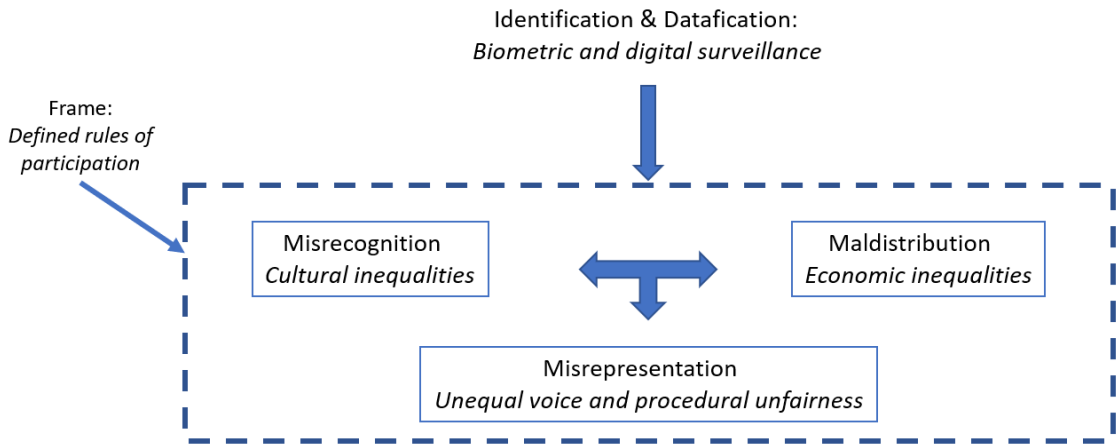
Figure 1: Data justice Framework – adapted from Fraser (2000, 2008, 2009).

4. Case background and methods

Aadhaar was undertaken by the Unique Identity Authority of India (UIDAI) – a governmental authority overseeing both implementation and operation. The system works using biometric data – iris scans

and fingerprints which 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. Since its inception in 2009 Aadhaar has been a rather novel technology that has gathered various moving parts and increased the range of services it offers along the way. Consequently, Aadhaar's history is an evolving tapestry of changes seen across the years. Aadhaar was presented in 2010 as a means to verify citizens when using governmental welfare and benefits (The Hindu 2010). In 2012 the Aadhaar architecture was advanced to enable 'online verification' to be used by private entities particularly telecom companies and banks (ET 2012). Aadhaar since then has been used for a variety of services like opening bank accounts, receiving subsidies, or direct benefit transfer (Sarkar 2014, UIDAI 2014a, 2014b). Enrolment itself is 'non-mandatory' and is to be demand-driven, (UIDAI 2014a), though Aadhaar itself is mandatory for receiving government subsidies through a key service called 'Electronic Know Your Customer' (e-KYC). This offers electronic authentication and verification of individuals. Aadhaar e-KYC mandates linkage of bank account for governmental subsidy, and to mobile number for communication by text messages in relation to government subsidies (MoF 2016).

This governmental use of Aadhaar grew alongside and inspired further interest in the commercial usage of Aadhaar verification. An 'open' architecture of digital infrastructure for Aadhaar was evangelised by proponents such as iSPIRIT, a 'private' think tank which has enabled the availability of cloud based digital services known as 'India Stack' to be used across public and private sector services and as a basis for digitally driven financial inclusion (Dattani 2019). 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 verified data consumed by multiple private sector players. This includes provision of APIs for both public and private sector use.

But in 2018 September Indian Supreme Court ruled that mandatory Aadhaar use for private sector was disallowed (The Wire 2018a). The interpretation of the ruling meant that while no private sector service can make Aadhaar mandatory unless it was legislated. But what is questionably termed as 'voluntary' use still continue and so are actively used by residents when they engage with many digital platforms. In fact, the Indian government followed up in December 2018 with efforts to provide legislative backing to the voluntary use of Aadhaar in private sector (ET 2018d). This use of Aadhaar is essentially done on the basis of 'informed consent' but the procedures undertaken for securing consent has been contested legally and in practice. This is especially because the law that ratified Aadhaar and its defined process of consent for data collection by the government emerged in 2016. But biometric and other data had been collected since 2010 (ET 2018c). Mass collection of consent by the government was done in what has been referred to as 'consent camps' (ET 2017) with a rather

bureaucratic approach to getting signature by rote and one which seemingly applies consent 'retroactively' after the wider roll-out.

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 2018b). Aadhaar as a digital identity has prominently enabled options like mobile payments or digital wallets based on the linked bank accounts in the last few years. The Indian government, driven by Aadhaar as a core technology has pushed for a 'state-of-the-art' digital payment system (RBI 2019a). But the adoption of digital payments has been unequal with the informal sector struggling to achieve participation. This was exacerbated by the demonetisation of currency notes that happened in 2016, disproportionately affecting 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.

Given this as the context of Aadhaar, a more focussed 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 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 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 2018).

The ecosystem of technologies studied is shown in Figure 2 and is understood to have Aadhaar as the core digital identity, and two other components provided by private sector companies. Aadhaar is used by the state to biometrically identify individuals and create under UIDAI's database a unique verifiable record of their personal information. This information then can be used by the individuals in seeking job opportunities on user facing digital platforms on which they again provide a copy of their personal data, which can be verified against Aadhaar.

The user-facing entities of the ecosystem are of two groups: 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 many bigger players joining alongside 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 where some of them used 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 improving smartphones and location-based services. The focus here is on cab-drivers' use of smartphone based 'ride-hailing platforms' 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 on 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 as a valid identity as a potential worker.

Other than the above digital platforms there is the presence of digital trust services (e.g. BetterPlace, Yoti). These are used by recruitment portal and gig-work apps as a business-to-business service to 'verify' informal workers using governmental identity information. Here verification works by the photo and personal details on documentary proof checked against information provided by the informal workers on their user profiles. With Aadhaar these work in two modes. First option is for 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 services use these e-KYC, XML or QR codes to do faster and bulk verification of information provided by the workers.

The role of these digital trust services 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. Ultimately Aadhaar either directly or through digital trust services becomes a popular means to verify both user identity and their personal data provided to the digital platforms.

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[2] This has been limited after a recent Supreme Court ruling disallowing private sector use.
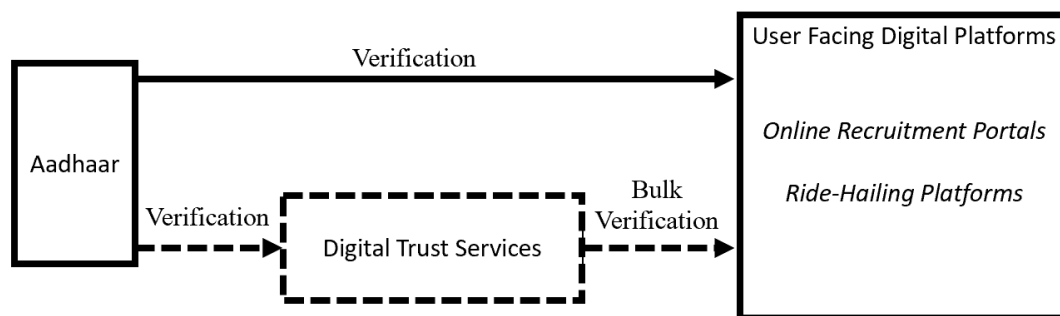
Figure 2: Ecosystem of Technologies in Aadhaar Verification of User Identity and Data.

The case study is ethnographically informed with data collected (see Table 1) mainly using semi-structured interviews and observations (Atkinson & Hammersley 1998, Yin 2014) and thematically analysed using the data justice framework described earlier (see Figure 1). Interviews[3] of informal workers and worker group leaders were done between January to March 2019. The participants were recruited through referral sampling. The interviews focussed on the daily-life experience of using technologies of Aadhaar and its ecosystem with notes made by the author and recordings done where consented. Additionally, interviews of digital platform creators done as part of a pilot fieldwork in Bangalore during April 2017 were used to contextualise the data. These digital platform creators were part of the upper management of a leading 'blue-collar' recruitment portal which were used by some of the worker participants. The interviews were translated, transcribed and thematically coded. Coding was done first with the broad themes sensitised (Flynn & Gregory 2004) by the cultural, economic and political dimensions of the data justice conceptual framework used. The second round of data-driven coding then was used to further probe the sub-themes that emerged from data.

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[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.

Interview type (number of 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
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

Observation type (number of observation instances)	Anonymised reference
Domestic workers self-help group meeting (2)	DWM1, DWM2
Cab-drivers union meetings (1)	CDM1
Cab-drivers protest (2)	CDP1, CDP2

Table 1: List of Interviews and Field Observations

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. The author attended two sites of protest held by cab-drivers and the planning meeting of the cab-drivers' union where some of the interviews were held. In the case of the domestic workers, the author interviewed community and worker group leaders and also attended meeting of two different self-help groups where interviews were undertaken. Further secondary sources such as mass media content, government white papers and policy reports, technical blogs and documents, and websites of the platforms under study were all used to triangulate findings and contextualise the discussion below. All these are cited where appropriate. The findings are discussed below organised according to the conceptual themes.

5. 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.

5.1. Misrecognition

5.1.1. 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, and 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 services 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. Digital verification here replaces urban local-area informal referral networks which are traditionally used to seek employment. The impact is that digital platforms tend to replace existing local mutual 'trust' networks, sometimes in place for decades. These networks 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, DWM1, CDM1). As one of the domestic workers puts it:

> I have lived and worked here in this neighbourhood for nearly 30 years and things work on a trust basis… Through people we know when someone is looking for a domestic worker and I will get a word of it. Sometimes people even turn up at our local area to find us. (DWA8)

This ability for household employers and job seekers to seek each other out locally as a specific function is something many digital recruitment platforms seek to provide, as mentioned by a senior employee of a blue-collar recruitment portal:

> If you apply for jobs in Delhi, we assume you are looking for jobs in Delhi. And then later on we ask for the locality that you live so we can target nearby jobs... Here [*Aadhaar verification*] replaces some alternative trust systems [*such as*] - 'I know you; you live down the street'. (DPL2)

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

Thus, verification by the digital platforms mainly works to signal trust to the clients enabling them to gauge their risk in engaging services of a new employee. But a similar function is not available to the workers of digital platforms as the clients themselves are not verified digitally, resulting in an asymmetrical one-way formalisation of surveillance and recognition. Domestic workers highlight the asymmetry of verification as an issue of safety. The asymmetry directly hinders their ability to easily recognise potential employers and knowing about their local work conditions, as the traditional peer networks provided a possibility to informally vet households of employment (DWB1, DWB3).

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). As one driver puts it:

> Even before we get into the car, they ask for everything about our life including Aadhaar and driving license. Without these we can't begin work at all. Customers on top of this have safety features on their app. What do we have? How do we know that the customer is a good person? (CDA9)

These asymmetrical practices in effect 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.

5.1.2. 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 doesn't help them gain personal legitimacy as drivers during their daily work on the road. Drivers cites a 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, as one of the drivers mentions:

> [*The ride hailing app company*] was very helpful and only needed Aadhaar and PAN[5] card details to onboard me to the app and they do it very well. But once we are working for them [*sic*] they don't care about us. If there is a problematic customer or a payment issue, I as driver or worker don't get any support. They support the customer only. (CDA5)

Further the issue of recognition crops up when drivers need to engage with the police during their workday (CDL2). Traffic or beat police, as reported by cab-drivers, use their prior disposition of

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[5] PAN - permanent account number. PAN card is required for drivers to register as partners with rider hailing apps.

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).

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[6]. Here an organised, formal unionising of drivers and collective efforts with strong political party patronage has long existed through 'auto stands' (local area parking spaces that act also as worker meeting spots) (Transparent Chennai 2012). 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 autos and cabs) 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. Cab-drivers' union now issues paper identity cards that they seek to use, to signal their union membership. As one of the leaders during the union meeting said while addressing the crowd of cab-drivers:

> Please pay the subscription without fail and don't forget to get the [*paper*] identity card. Be sure to paste your photo on the card. Remember, that this [*identity card*] is the only validation we have to show that we belong together and that you also have a group of people behind you. (CDL2)

These collective efforts of the drivers are directed to claim their legitimacy given the lack of support on this front from the digital platforms, clearly for situation such as being stopped by the police or being challenged by customers during work on the road (CDM1, CDL1).

A comparable experience is recounted by domestic workers whose verification using Aadhaar details to seek the job through recruitment portals doesn't translate to them being trusted at their daily work situation. In apartment complexes specifically they routinely sign in at the gates with their time of work, sometimes with mobile numbers and other personal details. This as one of the domestic workers puts it works to safeguard herself in case of suspicion:

> We sign in a register [*at the gate*] with the time in and out. If any incident happens or anything goes missing, they won't ask me - as they know exact time I came in and out

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[6] Also known in many other countries as tuk-tuks.

> [*of the apartment complex*] as there is an entry. In many places there are cameras also to monitor outsiders like repair-men or delivery-men, so they know who comes in and wont question me as I am known to them (DWB6).

Much like the cab-drivers, the domestic workers need to seek alternative means in claiming their legitimate role as a worker in spite of Aadhaar being a route to 'verification'. It is seen that while a digital identity provides increased employment opportunities, the cultural impact of digital verification is a based on a status subordination of the marginalised communities. 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 workers. Aadhaar-based verification in its social role is directly used to assuage security anxieties of the employers who hail from middle and higher socio-economic classes.

5.2. Maldistribution

5.2.1. Limited digital financial inclusion

Aadhaar and its aims are directly related to two aspects of financial inclusion – as verification for bank accounts and to enable digital payments. Both these aspects have had specific impacts on the informal workers under study.

While Aadhaar uses has increased coverage of bank accounts, it is acknowledged widely[7] that in practice Aadhaar mainly acts as another paper document to prove individual identity and make verified bank accounts a channel for receiving government subsidies. The expected benefits and reasons given by domestic worker interviewees' for signing up to Aadhaar are tied to narratives of seeking economic betterment related to such uses of banking: easy access to government subsidies and cash benefit transfers, and also possibilities to access loans from both public and private lenders (various interviewees, DWL1, DWN2). Here Aadhaar does act as a valid identity - albeit used as a paper document, in engaging with existing credit opportunities made available by the self-help groups, according to the experience of one of the leaders of the domestic workers self-help groups (DWL1).

Digitally-enabled financial inclusion beyond this is limited, as further formal economic participation using verified 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

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[7] 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).

domestic workers whose wage income and living expenses continue to be transacted in cash, and their bank accounts only work to receive sometimes infrequent government subsidies. Recounting this scenario, a domestic worker said:

> I know sometimes [*subsidy amount*] is received because of messages that come to my phone. My family members will read and tell me. We get that money for expenses. But beyond that the bank account is not being used for anything else. (DWA3)

With the sections of the wider economy that the informal workers engage with being still cash-oriented, cash is still king for their livelihood despite the advent of bank accounts on the back of a digital identity (various interviewees).

On the other hand, following demonetisation, cashless and digital transactions and smartphone based digital payments market saw immediate increase (Pal et al. 2018). Informal workers saw the necessity to participate in the digital economy for their livelihoods and encountered rapid changes in employment and their income governed by the digital platforms. Particularly, the gig-economy apps sought to replace 'cash on delivery' transactions. In case of ride-hailing apps digital payments were clearly presented as a convenience and attraction to cab-riding customers – in a bid to increase demand of platform usage. As Aadhaar increased possibility of digital payments for the customers, cab-drivers became increasingly dependent on the digital platform's integrated payment solutions such as digital wallets or card payment interfaces. To match this customer demand, during the initial marketing phase, drivers were incentivised to join with full verification using Aadhaar. This was required for them to receive digital payments of total fare with the driver's shared paid through a verified bank account. Previously cash payment of total fare directly would be received by driver and the platform's share deposited by the driver later.

For the cab-drivers, beyond the digital payment options imposed by platform, there is not yet a widespread daily-life use of digital payments. Their main use is to get digital payments from fare riding customers and to be paid using their verified bank accounts used for their work purpose. This payment process though has been reported to have frequent operational delays in transferring customer fare payments into the bank accounts of the cab-drivers (various interviewees). Demonetisation essentially pushed in a patchy fast tracked roll out and adoption of digital payment and in an unequal way that adversely affected marginalised communities. It affected the livelihoods of cash-dependent informal workers by increasing daily cash-crunch. Additionally, the informal part of the economy that the cab-drivers depend on was affected, due to the inability of small businesses like micro traders who struggled to adapt to digital payments (Unni 2018). On the other hand, Aadhaar and its digital verification provided a convenient means for the upper and middle socio-economic classes to switch faster into digital payments.

Moreover, digital payments also cut into the cab-drivers incomes. For instance, when 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 cab-drivers see both a lowered income and a situation of daily cash crunch. The initial promise was one of a lower commission paid to the digital platforms with the drivers promised higher direct income (CDL1). This in practice meant cash income in hand was replaced by lower amount in bank. This affects the drivers adversely as they still use cash in their daily lives. As one driver mentions:

> Three years ago, if I drove for 12 hours, I earned Rs. 5,000 in cash. Now if I drive 12 hours, I earn Rs. 700 in my account. I am expected to drive 18 hours in a day to survive. (CDA3)

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 customers, after accepting rides and ahead of pick-up, to agree on cash payments. This practice is widespread among auto-rickshaws whose drivers are not governed by platform-imposed revenue targets. But cab-drivers cannot undertake this workaround as the pressure to meet targets makes rejecting rides difficult (CDL1, author observation), This further makes the cab-drivers caught in a cycle where the end of day earnings may not translate to enough cash in hand to managed their expenses easily. Thus, the imposition of digital payments spurned by growth of digital-identity based solutions affects informal workers disproportionately, compared to upper and middle socio-economic classes who have access to formal and regulated banking.

5.2.2. Monetisation of data

At its core, digital verification is presented as a direct economic benefit to informal workers nudging them to hand 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 author observed a case of 'special offers' made to jobs seekers while signing up to

recruitment portal. This was seemingly targeted 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 present value for the core part of their business model (DPL1, DPL2). Specifically, Aadhaar's ability to digitally verify and act as signal to the potential employers who are the clients of digital platform forms makes it valuable. As one of the senior employees of the blue-collar recruitment portal mentions:

> We kind of have a special place [*for Aadhaar*] in all this - for the fact that it can be digitally verified and so gives it a greater potential for value for use, in terms of showcasing the job seeker in a more interesting manner commercially than other forms of identity. (DPL1)

This 'value' of verification is also seen to be part of the wider economic performance of the such platforms – with ride-hailing app valuations driven by verified driver numbers (Traxcn 2016), and consolidation in the recruitment portal market based on their 'blue-collar' worker user-base (Modgil 2017). The state has also bolstered this by increasing datafication due to policies like the National Career Service (NCS) government portal aimed at informal labour which makes Aadhaar mandatory (NCS n.d.) for registration for job search. This 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. This enables extraction of economic value of user data through the monetisation practices on these platforms. 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. The platform's clients follow 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 the marginalised 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.

5.3. Misrepresentation

5.3.1. Informed consent issues

The main procedural issues are around Aadhaar's data collection, its linkages and sharing of personal data to digital platforms through verification. The interviewed informal workers acknowledge routine signing and filling up of forms during enrolment and linkages. These were 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. Even though it is the dominant language of governance and commerce in India, English-language literacy among informal workers is low (author observation). As a cab-driver mentions:

> [*The ride-hailing app company*] get the documents [*including Aadhaar*]. There is terms and condition shown at this point - which runs for 3 pages. It is in English. I don't know to read English. [*The company representative*] would say you can continue only if you agree, only then you can drive the cab. Most of us drivers can't read English. Even if they are educated, they probably would not read it… When we install any app we click 'accept' and start using without reading in detail right? Just like that. (CDA6)

These issues position the surveilled individuals facing a lack of information while giving consent. Particularly so for the informal workers who are disadvantaged in data-literacy and language – a systemic issue already faced by marginalised groups (Kaur 2018). As one of the domestic workers puts it in relation to linkages:

> We give Aadhaar and whatever details they ask for - 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). A similar push to link Aadhaar was also undertaken by ride hailing apps companies. This was felt directly by the workers as a sort of coercion as one driver recounts:

> In the beginning there was no need to give Aadhaar during onboarding of the car [*to the ride-hailing app*] but about 3 years ago we got message that 'if you don't attach your Aadhaar number within a time limit your driver profile will be blocked [*from the app*]. Your cab will be offloaded [*from the app*]'. We felt like it was blackmail. (CDA2)

When the livelihood of the cab-driver is directly brought under question, it presents an inability for any real 'voluntary' use of Aadhaar.

The complexity of this situation is due to Aadhaar being made 'mandatory' for income tax purposes – only because it is to be linked mandatorily with permanent account numbers (PAN) used for income tax filings. But the details or Aadhaar itself is not mandatory for a private company use. But Aadhaar is routinely pushed as a required document along with PAN in cases like the one described above. The clarity of Aadhaar being voluntary for private sector use was lacking until a clear direction on the disallowance of private use of Aadhaar authentication came in by September 2018. Even then the collection of PAN with Aadhaar continues. In fact, Aadhaar is still presented as a seemingly 'needed' document in recruitment websites of ride hailing app companies (author observation). Riding on the coat-tails of the state's authority in making Aadhaar mandatory many private companies continue to push for Aadhar as proof of identity. The 12-digit Aadhaar numbers collected until now by such questionable mechanisms – including those collected by telecom companies for mobile number registrations - still reside in the databases of the private sector agencies presenting risk of data misuse (HT 2018b).

5.3.2. 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, the redressal presented for these issues 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 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 issues. 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, various interviewees), 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 solutions directly. This creates a disparity for the marginalised groups who need to pay to access kiosk services as opposed to someone who can access mostly 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. As one of the domestic worker complains about this process:

> We go to [*governmental kiosks*] when there are issues. But they don't answer properly. They keep us waiting for answers and in the end ask us to go to ration shop [*for subsidy issues*] or online… If we knew how [*to use internet*] why would we be working in this [*domestic worker*] job? We can only go to 'net shop'. They ask for 150 Rupees as opposed to Rs 30 Rupees [*at the governmental kiosk*]. (DWB2)

Secondly, the safety of Aadhaar transactions is dependent mainly on '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, or a kiosk or browsing centre employee, to read text messages while signing up to online recruitment platforms or undertaking Aadhaar linkages with banking services. Many such text 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 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. As one of the drivers says:

> [*The ride hailing app company*] constantly says don't share OTP to anyone, but we get calls from their own people asking for OTP when we join so they can finish [*the onboarding*] easily. Also, if someone from the company asks me something, I am not in any position to say no. It is difficult. (CDA5)

Security 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). Such 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.

6. Discussion

Taken as a whole, the understanding of the 'what' of justice emerges – as equitable participation that can be brough about only by overcoming the subordination that the marginalised users of digital identity face in attaining fair recognition, distribution and representation. These findings discussed in this paper contribute to three research areas.

Firstly, the paper operationalises 'abnormal justice' and has contributed a novel addition to the arsenal of data justice theorisation. The framework used and its three dimensions provides a means to query the complex impacts of digital identity and ultimately the notion of justice. Justice can be formulated as fair access to legitimacy, as sought by marginalised groups in their use of digital identity in a bid to overcome the existing social imbalance of recognition that acts against them. This has implications where vulnerable communities still navigate a mode of categorical suspicion (Lyon 2010) inherent to their subordinated social position. A universal digital identity has the negative effect of attracting and even justifying routine surveillance on an already culturally subordinated group and thereby digitally reifying the socially extant inequity. 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.

Economically, digital identity is intimately connected to financial inclusion and poverty reduction programmes through agendas such as 'identity for development' (World Bank 2016, Beduschi et al. 2017). But these programmes need also to account for the impact of datafication that inevitably follows. A distributive aspect of justice then emerges where technology helping fair participation of the economically subordinated can also enable unfair exploitation of their personal data. 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. As the evidence presented shows Aadhaar provides an increased benefit to the already formalised section of the economy, reinforcing existing economic inequality. It essentially became an indirect means by the state to formalise the informal section of the economy (RBI 2019a, RBI 2019b), with negative impacts such as due demonetisation or a problematic digital payment market affecting mainly those who are already marginalised. The implication of this is a need for much

stronger response and regulation to stem the synergy of technology companies' business models and accompanying governmental push for ostensible digital securitisation and datafication of society.

In the political domain, justice as an aspect of representation is intimately connected to the wider voice-lessness of marginalised groups – the solution to which is devised through digital technologies and by datafication in recent governmental policies and programmes (Gurumurthy et al. 2016). Unjust rules for consent under processes of datafication deny vulnerable communities a voice in participating equitably, putting them at further disadvantage. For digital identity technologies in the global south, the linkage of multiple databases presents a possibility for cross profiling by the state and private entities without the explicit or valid informed consent of the individuals who have been brought under surveillance. Strong regulation is yet another need as seen in the aftermath of the Indian Supreme Court order disallowing mandatory use of Aadhaar by private sector. But legislative backing for voluntary use by entities like banks and telecom companies to verify its customers using Aadhaar has been fast tracked by the Indian government (LiveMint 2019). With this the routinisation of Aadhaar as the *de facto* proof of identity has been cemented. The vulnerable population continue to undergo negative impact of surveillance and datafication as it becomes easier for Aadhaar to be demanded even if it is only supposed to be voluntary for the use of private sector services.

Building on this, the paper in studying datafication in the global South goes beyond the individualistic-centric paradigms of privacy addressing an acknowledged gap in research (Marwick & boyd 2018). Much as Solove (2013) argues it is seen here that marginalised users cannot be expected to 'appropriately self-manage' privacy considering the multiple structural problems at play. So, as highlighted in this paper, consent mechanisms depending on actions of marginalised users or through intermediaries (Lehtiniemi & Kortesniemi 2017) need to include fairness principles. It is found that an emphasis on procedural fairness is needed to provide equal 'voice' through truly informed consent and a means to question any vulnerability arising due to digital technology.

Secondly, this paper contributes to the body of research on ICT4D and electronic governance on the wider effects of digital identity. The evidence on Aadhaar discussed in this paper bridges a gap in knowledge about datafication in the global South. Similar studies by ICT4D and critical data studies researchers such as Kelly & Noonan (2017), Taylor (2017), Masiero & Das (2019) and Khera (2019) have focussed on a critical analysis mainly on the role of digital identity is a governmental context. The paper seeks to extend this argument as shown, to include the use of Aadhaar as an identity for verification to access other platforms. This is an area of research which has received limited academic attention to which this paper has provided two specific contributions. First, the theorisation of 'recognition' as a function of surveillant technologies has been introduced as a novel means to acknowledge the role of

digital identity in the society. A second important contribution has been the empirical analysis demonstrating the permeating nature of datafication and verification practices.

Finally, the case studies chosen also provide insights on the 'who' of justice – the second node, which particularly contributes to further the understanding of digital labour and the gig-economy in the global south. The paper has demonstrated digital technologies can exploit multiple forms of subordination feeding off one another to reinforce inequalities and reifying the subordination across stakeholders in the digital realm. This points to the idea that, stakeholders claiming for data justice are to be analysed relationally and by understanding their positionality. In exploring this a 'data-class' structure based on symbolic production of or user-labour of data as discussed earlier only partially engages with the complexities of the claims to justice. This paper demonstrates that critical analysis espousing Fraser (2009) to engage with contestations of justice between stakeholders, their positionality in the ecosystem and also acknowledge existing subordination in play. Within the context of gig-economy this signifies the inherent inequalities between the contesting stakeholders such as users, clients, intermediaries and workers. These ideas strongly resonate with Heeks's (2017) analysis of on structural inequalities in the gig-economy and Graham et al. (2017) notion of asymmetries in digital labour that adversely affects the labour rights of the gig-workers. The paper adds to this body of research by providing an empirically validated rubric of cultural, economic and political subordination and injustice to effectively understand the positionality of stakeholders within the gig-economy.

7. Conclusion

The intricate entwinement of surveillance and datafication under digital identity has been explored in this paper. Using an empirical study of Aadhaar, India's biometric digital identity and its use among informal workers groups of cab-drivers and domestic workers a data justice framework derived from Nancy Fraser's (2009) work on 'abnormal justice' has been advanced. The analysis shows by using dimensions of cultural recognition, economic distribution and political representation that an exacerbation rather than narrowing of inherent inequalities occurs between marginalised communities like informal workers and the more formal entities of Indian society such as commercial businesses including digital platforms, and their upper/middle-class clientele. Particularly it presents a complex synergy between governmental and private sectors through the dataflows between them and having an impact on an already vulnerable population. The paper also proposes understanding data justice stakeholders using an extended 'data-class' notion incorporating the complex nature of cultural, economic and political interactions and subordination – that which is existing and enabled by data.

Building on this paper's groundwork to understand the global South context, two specific areas can 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. This can provide insights into the impact, both positive and negative, once they take up gig work.

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5.2. Paper 2 : Spatiotemporal (in)justices in digital platforms: An analysis of food-delivery platforms in south India

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Spatiotemporal (in)justices in digital platforms: An analysis of food-delivery platforms in south India

Shyam Krishna[1]

[1] Royal Holloway, University of London, UK
shyamkrishna.r@gmail.com, shyam.K.2014@live.rhul.ac.uk

Abstract. With on-demand labour and location-based services becoming increasingly common, this paper explores the complex social justice impact of spatial and temporal elements of digital platforms. A conceptual framing of 'spatiotemporal justice' is proposed to explore the consequences of algorithmic control of space and time experienced by workers. An interpretive case-study is built focusing on work practices of food-delivery platforms in the south Indian city of Chennai. The qualitative methods used include semi-structured interviews of food-delivery workers and an autoethnographic study by the author as a worker on digital platforms. The empirical analysis demonstrates that (in)justice is involved with the workers' negotiation of multiple micro-spatiotemporalities in their daily work practice. The impacts include workers being forced to balance spatiotemporal risk and stress against the benefits of employment. This is contextualised by inequities propagated due to imperfect digital representation of, and the asymmetrical information on spatiality and temporality within the platform. The workers are further affected adversely in their spatiotemporally subordinated power relationship with other groups of digital platform's stakeholders. Spatiotemporal justice as conceptualised here has direct implications in how future of work is defined, governed and how digital platforms are held accountable – particularly in the global South.

1. Introduction

The recent conditions of COVID-19 globally have brought into focus the growing reliance on food-delivery digital platforms and the physical, health and economic risks faced by its workers. 'Gig-work' as a mode of flexible and temporary task-based employment using a digital platform is a result of the advances in spatial technology such as smartphone mapping, location-based services, and global positioning systems. A core tenet of gig-work platforms is the on-demand labour or 'just-in-time' customer service [1]. In scrutinizing these platforms centering their digitally mediated spatial and temporal practices, this paper analyses the social justice impacts using an empirical case-study of food-delivery workers in south India.

This paper contributes to critical studies of gig-work and the wider gig-economy which emanate from fields such as information systems (IS), ICT4D, human geography and surveillance studies. Scholars studying digital platforms globally show evidence of inequities arising due to the changing nature of work and the precarity associated with it [2,3,4]. Perspectives from Graham et al [5] and Heeks [6] focus on the developmental impact questioning what 'decent' gig work would and should look like. In a similar vein Graham and Woodcock [7] highlight the need to understand 'fairness' of work in factors such as income, working conditions and risks under digital platforms. Critical analysis of gig-work also hints at inequities arising from the core spatial and temporal characteristics of technologies. Works such as Shapiro [8] and Woodcock [9] reflect on workers negotiating between spatial and temporal autonomy - provided by the promise of flexibility to the workers, and control – brough about by the platform's management of workers tasks through algorithmic manipulation of location and time.

Two gaps in research has been identified which the paper addresses. First, a focused spatiotemporal angle with a detailed study of digital spatial and temporal elements in gig-work remains largely unexplored. A recent exception to this in IS research is Wu & Zheng [10] who strongly argue for a spatiotemporal perspective as a valid means to understand gig-work practices. Secondly, as protests unfold in south India within the food-delivery sector [11], there is growing interest for research on the workers experiences. The wider body of critical research on gig-work in India largely do engage with the various practices of spatial and temporal control as a main point of discussion. But most of such research are limited to studying cab-hailing platforms [4,12], with food delivery services under studied. Moreover, this paper takes a step further to query the implications through the minutia of the spatial and temporal features of gig-work. Through this, the paper seeks an insight into how data and algorithms related to routine management of time and space of the workers impact their claims to fairness and equity.

To answer this, the paper uses the lens of 'social justice'. This would encompass issues such as fairness and equity within the work and livelihood of the gig-workers. Various interpretations of social justice have been connected to the study of digital technology such as Heeks and Shekar [13] and Dencik et al. [14]. But such literature does not address the specifics of spatial and temporal aspects, their inter-relationship and their (in)justice impacts. Much as Dencik et al. [14] considers the lens of justice works to identify an 'ethical path' through the critical and complex issues surrounding technology use. Encapsulating these ideas this paper proposes 'spatiotemporal (in)justice' to interrogate practices and peculiarities from global South and question whether the spatial and temporal elements, and their entwinement impact gig-workers in a fair and equitable way.

Given this context this paper seeks to answer the question: *'What are the social justice impacts of the spatiotemporal characteristics of digital platforms?'*.

The rest of the paper is structured as follows. First the theoretical concepts surrounding space, time and social justice are introduced. Then the paper presents the case study background and the methodological basis of the research. Finally, the findings are presented with a discussion and concluding thoughts on the empirical case study.

2. Spatiality, Temporality and Justice

Multiple perspectives of justice have been connected to spatiality and temporality that become relevant to a construct of 'spatiotemporal (in)justice'. Social justice and its intersection with digital platform have been used to understand the (un)fairness of the use of data and (in)equity among the users of technology [14]. The use of social justice as a research lens also acknowledges that issues of (in)justice as Fraser [15] presents emanate from underlying complex cultural, economic or political factors that may not be outrightly evident. It follows then that 'spatiotemporal (in)justice' as this paper proposes would zero-in on how elements of 'space', 'time', their entwinement, and their corresponding digital representations affect issues of (un)fairness and (in)equity within platform mediated work practices. Querying social justice then will involve understanding how management of time or space results in issues such as (un)equal distribution of economic value or resources, (un)fair conditions of work and (im)balance in power within the working environment. These notions can be explored within existing theorisation of spatiality, temporality, and their overlap to construct the conceptual basis for this paper.

'Spatial justice' as presented by Soja [16] seeks fair distribution 'in space, of socially valued resources and opportunities to use them'. As a key interpretation of spatial justice Soja [16] invokes the 'right to the city' notion of Lefebvre [17]. He presented that spatiality is socially produced and reproduced through practices and daily routines, and that explicit 'representations' of space determine the various ways it is experienced. This has intersections with how technology control representations and access to space and spatial resources. Other researchers have picked on this thread. Akbari [18] for instance presents 'spatial data justice' derived from social justice theorisation of Fraser [15] and Soja [16]. She argues that spatial issues in digital context is a matter of intersectional claim for justice. This touches also on what Bissett-Scott et al. [19] term 'spatiality of injustice' and 'injustice of spatiality' in relation to digital technologies. This encompasses impact of digital technology distributed spatially and created by digital interpretations of spatiality.

Exploring 'temporal justice' would serve to understand digitally mediated time and its impacts. Goodin [20] interprets temporal justice directly in relation to labour using language of 'distributive justice' – of fairness in the form of 'discretionary time' available for the worker as a remainder after allowing for time at work and time for worker's personal needs. Three other notions of temporal justice are discussed by Henckel and Thomaier [21]. They argue temporal justice: is dependent on structural, material, and spatial factors among others, is relative depending on cultural and economic context, and that temporal inefficiencies experienced are also a cause of temporal injustices. Sharma [22] advances a similar concept of 'temporal worth' – the notion that workers experience time differently and are varyingly compensated for their time, depending on how they are positioned and valued in a temporally dictated economy. This view is acknowledged by Wajcman and Dodd [23] who say that temporalities are experienced in 'differential and inequitable ways'.

Picking on the above ideas and to engage with (un)fairness and (in)equity surrounding the dual concepts of spatiality and temporality this paper acknowledges first the co-constitution of space and time [24,25]. That manifestations of space and time are interdependent and socially impact each other. This as 'spatiotemporality' is summed up by what Olmstead [26] presents. They refer to the seminal work of Massey [24] to declare that 'unique spatiotemporal topographies' exist across different platform (in mostly urban) contexts and call for exploring these in research.

Research on IS largely consider temporal constructs as reviewed by O Riordan [27] and Shen et al. [28]. Prominently Orlikowski and Yates [29] argued that temporal structures are shaped by and shape the daily 'recurrent practices' of worker's organizational space. A similar perspective is provided by Díaz Andrade and Doolin [30] how temporal practices in the social lives are entwined with their use of technologies (using a case study of refugees' experience). Within studies of digital platforms and gig-work the interleaving of spatiality and temporality become directly relevant. As Graham and Woodcock [3] argue platforms bring timely supply of and demand for labour together using location-based apps in a 'geographically sticky' manner. Once location is captured and the gig is assigned, the temporal elements such as scheduling or task management take over, providing on-demand, 'just-in-time' labour from spatially close gig-workers [1]. Graham [31] summarises this as platforms solving 'space-time' problems of consumers by approximating the world digitally – through maps, location-data, timestamps and related other data and algorithm. There is further evidence given by Baiyere et al. [32], Manriquez [33] and Moisander et al. [34] of the way digitally mediated spatiality and temporality work.

Many existing research studies focus on space and time with cues on issues of fairness and equity. But a gap can be still seen in addressing the intimate relationship between spatiality and

temporality within the specific practices of gig-work and as experienced by workers. For instance, spatiotemporal ideas of (in)justice are found in Chen's [2] work where the varying temporal experiences under algorithmic control of time interleaves with the inequities that Chinese taxi drivers face when they move spatially through the city. Similarly Sharma [35] researches on taxi-cab drivers, showing that power flows spatially and temporally – by workers providing their time as labour and in the act of physically moving the passenger around the city An idea on spatiotemporal imbalance has been discussed by Kitchin [36]. He considers that gig-work practices result in 'space–time movements being commodified' and 'leveraged for the benefit of some at the expense of others'. All these reflects albeit indirectly on ideas of (in)equity and (un)fairness as a result of digital representations of space and time.

A very strong cue for studying spatiotemporal (in)equities comes from Wu & Zheng [10] who take an important 'sociomaterial' perspective using a case study of Chinese food-delivery workers. They theorise that the 'reconfiguration' of space and time as the basis of, and that which shapes digital platforms. They argue for a spatiotemporal perspective in conducting a critical analysis of platforms and the power structures that these platforms embody. A similar hint on this issue is from Greenhill and Wilson [37] taking an IS perspective to consider that gendered nature of spatiotemporal flexibility in work as being driven by 'perceived benefits to the employer, rather than issues of social justice'. Similarly, Graham and Anwar [3] mention that an understanding of 'the spatialities and temporalities' of digital labour market is needed to better shape them and hopefully provide the gig-workers a fairer future. In global South context Firmino et al. [38] relevantly present that there is an inherent spatiotemporal algorithmic logic followed by digital platforms rooted in global North assumptions. They call for exploration of local contexts of workers in studying the commodification of their space and time echoing Kitchin [36].

Deriving from the above discussed notions spatiotemporal (in)justice then encapsulates various aspects within the work practices of gig-work. Much as Massey [24] considers every space and also its digital representations are governed by the rhythms of how time acts within it and in turn time is influenced by the space it is enacted within. This forms the basis of how spatiotemporality is queried in this paper - both in digital and its corresponding physical sense. These would involve analysing notions such as the (un)fairness in algorithmic sense resulting in management of workers space and time, discriminatory potential of spatiotemporal data, the adverse impact of users due to spatiotemporal inefficiencies and (in)equity faced by users though spatiotemporal elements. These ideas direct the empirical discussion and analysis that follows in the next few sections.

3. Research Background and Methods

The app-based food-delivery market in India 2019/20 services 500 cities [39]. Of these, this research was conducted in the south Indian coastal city of Chennai (the capital of Tamil Nadu state). The research focuses on analysis of labour and business practices across Swiggy, Zomato and Uber Eats – the 3 major digital food-delivery platforms. Customers using smartphone apps receive nearby list of food-delivery establishments like take-away places or restaurants. These orders are then algorithmically queued for the restaurant who use a separate app and the order is assigned to nearby rider who is available to pick-up food and deliver. Orders can be 'batched' together (or called 'multi-orders') with more than one order picked up from same restaurant and delivered to multiple customer delivery locations.

An approach of interpretive case-study has been used in this research [40,41], with data collection done between December 2019 and February 2020. First, qualitative semi-structured interviews were conducted with riders across the 3 main platforms who were identified using snowball sampling initiated through personal contacts. The author also conducted auto-ethnography by working as a part-time rider over 6 weeks. Over all 27 semi structured interviews were conducted with varying lengths between 30 minutes to 2 hours. These interviews took place either at the rest spaces (usually on the side of the roads and in front of restaurants where the riders congregate in between their order runs) or was conducted in public places such as cafes and the beach. Further observations were done visiting all 3 major platforms' support centres as a potential rider (5 visits in total) and when author attended a strike action & a protest planning meeting (both done as a researcher and not as a rider). Interviews were also conducted at these locations. The author was part of two rider Whatsapp groups (one mandated by the platform and the other setup by local riders). Majority of the interactions were all conducted in Tamil language of which the author is a native speaker.

The methodological basis for studying the author's own use of digital platforms was under what has been presented as the paradigm of 'self-tracking' [42] and is acknowledged as a digital ethnographic method [43]. This entailed the author's observation and engagement with the data and accessible traces of algorithmic elements generated during the personal use of apps as a rider and as a customer. These include use of screenshots and screen video grabs of the smartphone. Data from apps were collected with due anonymisation and only accessed by the author who was the sole user of the apps [44]. The author also collected autoethnographic photos, video, and audio data during the process of daily work as a rider, memo audio and written notes as a form of research diary. The author has been sensitive to balance own experiences as a rider and interviewees' experience by using the autoethnographic engagement with apps, its data and algorithm mostly to substantiate and bracket

data gathered from interviewees' direct experiences. A clear distinction is made while referring to these experiences in the paper mentioning the source of data. To contextualise the collected data, textual sources in form of technical blogs and public documents published by platforms and media articles were used where appropriate. All data were originally in or are translated into English, transcribed where appropriate and thematically coded.

Coding through 'template analysis' [45] resulted in themes and codes. First level themes were broadly categorised in relation to customers, workers and restaurants. This guided the analysis and reflects the structuring used during data collection covering the whole cycle of gig-work. The analysis and the patterns emerging from the data were sensitised by theory. Iterative rounds of data-driven coding were used to further probe the data with emerging sub-themes on spatial and temporal elements which formed the imperative for this paper.

4. Analysis

This section presents the analysis of the case-study describing the details of digitally mediated spatiality and temporality that govern work and livelihood for the gig-workers. The section is structured based on the 3 major themes under spatiotemporal injustice identified: trade-offs, representations, and asymmetries.

4.1. Trade-offs between temporal stress and spatial risks

A common denominator across the three platforms studied are the task-level temporal and spatial controls experienced by gig-workers. Multiple points of digitally mediated spatiotemporal interventions at play were observed by the author's in their own experience and garnered thorough interviews. This can be seen in the simplest flow of tasks during a gig in figure 1 below.

The work begins with riders marking their spatial location and availability, followed by waiting time until a gig is assigned. A timed alert follows (30 seconds to 1-minute - some instances were lower) to accept assigned order. The platforms design choice also does not reveal location of the restaurant until order is accepted (or customer address in case of food being picked up). After this route maps are displayed for the worker to navigate to pick-up the food. Here a spatiotemporal balancing act is forced where temporal stress is used to control and institute competition forcing riders on longer distance of travel and speedy actions, as riders point out:

> I am pretty fast in accepting orders and press as soon as it buzzes. It's not like I have time to relax and see what is written in there. If I don't [accept the order] someone surely is ready to do it – why waste an opportunity?

…

> Even if it is a long drive for the order, I will only know after I press the button [to accept the order]. I cannot decide that fast.
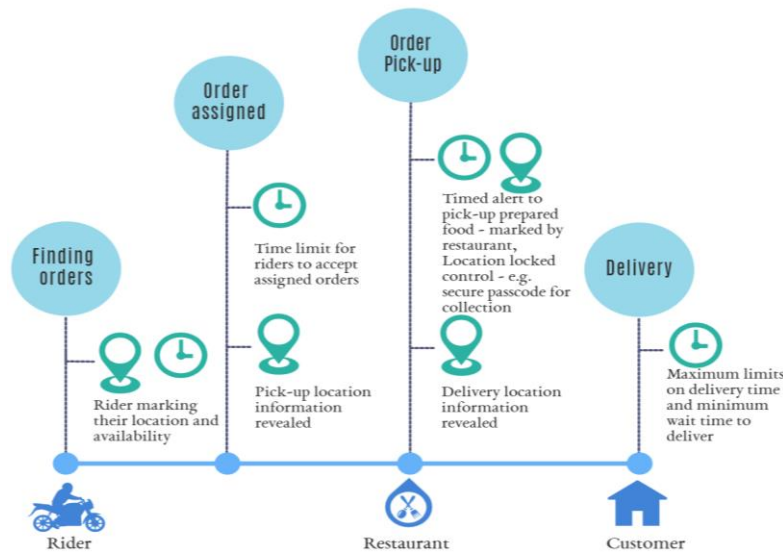
Fig. 1. Multiple spatial and temporal interventions in a standard food-delivery process.

At a specific location such as a pickup point, spatial and temporal elements complement each other to create similar stresses using temporal triggers. For instance as experienced the author, time-limited action or a timed alert is complemented by a location-based spatial control. In one instance a securely generated passcode is needed to confirm pickup of food and is made available to the rider when their smartphone location is within 100 metres of the restaurant. These as 'micro-spatiotemporalities' of control is seen by riders as expectation to travel faster when they are farther away even if they can't act immediately during the ride:

> As soon as [the restaurant] marks 'food prepared' the app will say there is only 2 or 3 minutes. I will be 2 or 3 kms away. I cannot do anything until I reach the restaurant.

Such temporal triggers or prompts linked to proximity of a location nudge the worker to be more efficient using haptic and audio-visual alerts. The larger impact is that the loud alarms and continuous vibration on the smartphone increase risk on road. As one rider recalls:

> I will be in heavy traffic and will be focusing on not hitting the bike in front of me. My phone will go brrr… brrr.. woo... woo… Its irritating. But I still need to click on it soon and not miss the order.

In the author's own experience riders endure a rather panic driven work environment where 'alarms' cannot be silenced and need to be responded irrespective of spatial conditions and risk. The multiple

intervening spatiotemporal stresses as part of the platform and app design push for speed of actions leaving risks solely as an issue of the worker.

Similar spatiotemporal trade-off of balancing longer worker hours against reaching distance-based targets are inherent to the payment structure set by platforms. For instance, meeting a daily minimum target of 20 location visits with 10 hours login time would pay a total of 900 rupees. It sets a target of having to physically travel to a new location (to a restaurant or a customer) every 30 minutes. But the cumulative weekly target stretches the expectation for moving to a new location averaging every 18 minutes (230 locations in 70 hours). These targets impose an elastic spatiotemporal control of work but with diminishing income returns across the week by commodifying and decoupling spatial and temporal targets. A rider choosing 10 hour per working weekday (total 5 days) would need to put in herculean effort to travel to a new location every 9 minutes working 20 hours over weekend to earn maximise weekly income. With delays, additional tasks and controls in play during a workday this can become next to impossible for many:

> I keep note of how close I am to daily and weekly target. But some weeks the effort I need to put in gets out of hand. Even if do achieve good targets the weekly targets will force me to put in more and more hours. There is no end and it just becomes really impossible sometimes.

Even those who manage to meet the targets can end up spending close to 16 hours per day. This forces the riders to take decisions to trade-off spatial risk for temporal flexibility by front loading their weekly work to 'catch' as many orders – meaning some riders ride around widely earlier in the week, hoping remain time in the week can be more under their own discretion. But there are further complexities such as multi-orders, customer disputes or technology failure. These can trigger a payment condition that revokes their progress towards weekly target or even completely disqualifies them that week. Such unfair formulation means the rider can only try to start another similar spatiotemporal balancing act the next week. Ultimately the workers are put in a position to either take up longer hours or face greater risk on road without which the income target is mostly unachievable.

4.2. Issues in digital representations of spatiotemporalities

Platforms impose some assumptions of certainty in digital representations of locations and time. When reality does not match the digital representation, it forces the workers to step in as a sort of subjective human interpreters - of what the datafied processes intended to achieve. The platforms rely on mapping mostly in English. With Tamil and transliterated vernacular naming of location, places and routes critical spatiotemporal elements come regularly into question. There is clear need for interpretations and error corrections. This means restaurant and customer locations on maps, delivery

routes and the estimated time for delivery are presented as objective information in many cases even if it may not be so. In the quote below a rider recalls an experience in delivering in Chennai's 'IT Corridor' – the hub for information technology offices alongside a busy highway with fast moving traffic. This inevitably forms a major area of activity with active presence of customers and restaurants within food delivery platforms:

> It is a wide 6 lane highway and there is no place to take U-turn. Restaurant location is marked on the wrong side. I know this by experience… If we go depending on the map, that's it! Another 2 km fuel waste for sure.

Every spatiotemporal negotiation is related to such financial or other costs, and even at work risk for the riders. The rider is this case would either risk by crossing the highway on foot or use their local knowledge to ignore the platform's mapping advice.

The riders also tackle commonly found problems of mapping, customer data literacy, or language issues by voice calls. They try to work around by relying on own local knowledge or by consulting fellow riders over Whatsapp groups – and support is almost always given immediately. In the author's own experience even while riding around in the city, riders help each other, irrespective of the platform they work on – including a case where a rider rode ahead showing the exact path to the author. The actual digital spatial controls and algorithmic rigidity means riders are forced to overcome platform erected barriers while achieving these workarounds. A case in point from author's experience is when a timed task must be done within 100m of a restaurant – but the actual location is marked incorrectly by the restaurant managers. This situation can easily escalate leaving the rider exposed to income reducing algorithmic triggers such as customer 'disputes' even as they work akin to a 'customer service' personnel to solve issues. Riders report that such disputes can see slow resolution or even an absence of one.

Underlying shortcomings of technologies tend not to account for real-world vagaries such as traffic and road conditions especially those which would be used by scooters. This increases inefficiencies for the rider as it takes away their ability to respond with practical solutions to the reality on road:

> When we get second order [in multi order] it would be good if I can decide where to go… [The app] will ask me to go via [a main road] over the flyover and come back another way. But I will never go on the flyover. If I can change and go to second delivery first it will be a easier ride and avoid the flyover.

Platforms also reinterpret spatial representations such as multiple pickups or drop offs as one action in a multiple or batched order creating possibility of rider income reduction. Every order picked up or dropped adds more time, effort, and costs to the rider, but these efforts will not be counted towards

income calculation. The platforms can and do change frequently the income calculations involving measurements of distance and time. These changes have made income per delivery and total incentive pay to steadily decrease (despite the initial promises of a high income).

The spatiotemporal elements further affect riders adversely when customers are presented with algorithmic estimations. When inevitable delays occur - like when rider solve errors in location - impatient customers who go by estimated time can intervene by calling up while the rider is negotiating traffic and adding to the risk on road. In an idealised delivery process the estimated time taken to pickup food (from the point of order being assigned to the rider) will be the same as the food preparation time at the restaurant (so would result in no waiting for the rider at the restaurant). But to account for demand at the restaurants the platforms algorithmically forecast preparation (specific to restaurant and the food ordered). In one of the known and complex models the platform can pre-assign a second order O2 to a rider (R1) when the delivery of the first order (O1) is ongoing. But the notification of the second order (O2) may be delayed algorithmically to account for a different rider (R2) emerging spatially closer to second orders' (O2) pickup point. Estimation errors in this affect not one but two income opportunities of rider (R1). The temporal deadzone when rider may be assigned an order and not notified is a point of multiple micro-spatiotemporal unpaid efforts - such as using their local knowledge to go near a popular restaurant and involving fuel costs. These efforts may be overruled by new order (O2) being notified to require moving to a different place. Moreover, platforms misrepresent the process of assignment and a myth of predictability is presented in a bid to spur a rider's near constant availability. Riders across all platforms are consistently told (as experienced by the author in onboarding training sessions) to go near to 'busy restaurants' and essentially chase or hunt orders, though the algorithms can overrule this.

4.3. Spatiotemporal information and power asymmetries

The specific aspects of how digital platforms manage spatial and temporal elements impose asymmetry in power and information that works against riders. Given local power dynamics with restaurants or customers as income entities do not undergo as much spatiotemporal control as the rider. Riders with their clearly visible role (with brightly colored uniforms) face subordination at their gig-work spaces where they occupy a lower rung of socio-economic position. Much as in other situations of entrenched subordination along caste or class lines visible within informal and precarious workspaces, riders are open to expectations of servility. They become answerable to restaurant workers and managers - and with the customers being at the top rung of an imposed hierarchy. This aspect of worker subordination is also strongly evident when a necessary 'deferential' attitude towards customers and restaurants is inculcated through formal trainings at platforms' offices. An equivalence

in protection or efforts for dignity of labour is not assured for the riders, making them undertake unpaid tasks rather than being able to challenge local power structures. A rider recalls the expectation for unpaid labour:

> We do everything from time to time. From parcelling food, picking spoons for the order, and cleaning the package if it spills… There is this [specific restaurant]. The manager their shouts at us to pack and move fast. That is not my job… But why risk offending him and get a complaint? He doesn't have the customer calling them. That is only my problem.

An explanation can be found in the acontextual dematerialisation of a space as a mere 'location' on a map. Every point on a map that the rider travels to puts them into micro-spatiotemporal negotiation as a worker - done both digitally and in real world. This complexity is not captured in the digital food delivery process . As this rider explains:

> If I go to a specific location on the map it's not as if the work is done by itself. It's not as simple as giving the parcel to someone. There are multiple steps on the app. We have to call the customer and be nice. There is a gate, a security guard, parking issues… In office buildings it's even worse, after that its either lift or stairs…

Something unexpected happening, such as when a food inventory runs out automatically means the rider is expected to resolve it given their subordinated position in an asymmetrical power relation. As recalled by a rider:

> If the restaurant runs out of food, [the restaurant] need to mark it as not available properly or give something else. What can I do? They ask me to call the customer and check. Can't they call? It is their customer too.

None of these tasks are part of the calculation used for payments. But these extra efforts increase total time taken and rider's costs – and reduces times available for paid tasks.

An asymmetry in availability of information such as ratings also impact the work practices within digital platforms. Customers can have near constant visibility of the riders through location, ratings, and profile-based surveillance from the point when order is assigned until delivery. A rider mentions that such issues leave them to face intense scrutiny on the time taken and even the route taken to the customer address:

> We know how long the ride takes. I ride here every-day. Wont I know what will happen? The customers see me on their app and they get some information. The app [estimates] it wrong… Many customers won't bother but one or two may make it a problem and call and instruct constantly – turn left, take a U-turn…

In author's own experience majority of the customers call the rider and expect calls as part of the service by the rider even while on road to follow up on the orders. But platforms actively discourage

calling including by extra prompts on apps. The riders encounter this unpaid labour which again eats into the time available for paid work.

This is further bolstered by an unequal ratings and feedback process. The riders are expected to give star ratings to restaurants and customers for the pickup and delivery experience and answer a set of questions. Customers and restaurants can give similar ratings to both restaurant and delivery riders. But the information that these 'stars' represents only affect the riders in the form of performance and tips (some platforms give extra payment of 5 or 10 Rupees for a 5-star delivery). Even though ratings and survey data collected from riders about information like parking availability, road conditions, and correctness of GPS location do formally enhance the spatial data held by the digital platform, riders themselves do not get to see the qualitative information on restaurants or customers. Resolving pickup and delivery issues mostly becomes contextualised by informal knowledge that riders share among themselves over WhatsApp groups.

5. Discussion

This paper furthers the understanding of (un)fairness and (in)equity within the context of data, algorithms, and digital platforms by proposing the construct of 'spatiotemporal justice'. The case study analysing food-delivery practices of gig-workers show three major ways in which spatiotemporality is imbricated with social justice – of spatiotemporal trade-offs between risk and stress, issues of digital representations, and asymmetry of power and information. The spatiotemporal design choices of platforms and algorithmic control show that many practices begin with an unfair burden on workers to balance temporal stress against spatial risk on the job. Further, as platforms seek to digitise physical food delivery practices, it is evident that errors and imperfect digital representations of spatial and temporal elements can bring up issues of (in)justice - such as the unpaid labour faced by the workers in performing platforms' promise of service to the customer. It is also seen that the spatiotemporal dematerialisation can extend and even add to unfair practices in physical food-delivery process. By privileging power and information to customer and restaurants, the platforms use the workers to negotiate difficult physical conditions with labour that is most often invisibilised. This happens under the close control and manipulation of workers' space and time. An ability perofmed by the platforms through data and algorithms.

This paper contributes a detailed analysis of the consequences of gig-work in south India. This is a valuable addition given the prevalence of similar research stemming from the global North. In this the paper's centering of spatiotemporalities in making claims for justice answers the call of Dencik et al. [14] for a new ontology of social justice. In doing so the research provides insight on the local

conditions in the global South amidst the related issues of the uncertainty under COVID-19 for workers in India and the ongoing protests and strikes for fair pay among food-deliver workers in Chennai [46]. In such ongoing debates the workers consistently voice their issues using language and terms which highlights the manipulation of spatiotemporal elements of their daily work. This paper has picked up this strand to provide valuable auto/ethnographic accounts of gig-work. The findings show the intimate and individual spatiotemporal machinations inherent to gig-work, unpicks the local global South specificities and above all allows exploration of the mostly opaque nature of platforms and algorithms.

Spatiotemporal justice also has congruence with the strand of IS research on ethics. Chiasson et al. [47] recently position a need for IS research to study ethics of Big Data, in a way that helps to theorise not only the extractive nature of data-driven 'surveillance capitalism' [48], but to include study of social actors beyond the management layers and understand complex consequences. This paper's co-positioning of spatiotemporality and justice helps us query practices beyond the notions of spatial and temporal at organizational level of the digital platforms. Gig-work is characterized by the capture and measurement of fleeting spatiotemporal elements such as worker location, distance driven, waiting times and timed alerts. By understanding the negotiation of these – what is termed here as 'micro-spatiotemporalities' – show that micro-politics is at play in the daily work practices of digital platforms. So, echoing Graham [31], it is this 'ephemeral' digital duplicate of the spatiotemporalities within the platform that becomes the arena for seeking justice and even resistance. Every task done by a gig-worker is a negotiation of what can be construed as a 'spatiotemporal cost' balanced against possible economic benefit.

The findings here go beyond the conceptualisation of platforms as an 'invisible' manager [49]. Spatiotemporal justice reconciles unfairness in digital representations with the actual impact on daily work practices of gig-workers. Reflecting on what boyd and Crawford [50] argue is an 'aura of truth, objectivity, and accuracy' ascribed to data and algorithms, this paper shows that inefficiencies, erroneous objectivity and unfairness in spatiotemporal representations have a direct impact on workers. Ethical design of algorithms [51] and fair governance of platforms then must consider the impact of their spatiotemporal approximations.

Both practitioners and academics can use the vocabulary presented in this paper of 'spatiotemporal (in)justice' to seek accountability from digital platforms. Spatiotemporal aspects can also help in claims for 'collective justice' given the clear subordination of workers compared to restaurants and customers. Globally as workers movements and struggles foreground 'fair pay' as a claim to economic or redistributive justice, the conception provided here exposes myriad (in)justices

beyond the redistributive sense. Spatiotemporal justice then would help establish truly 'fair' practices, standards, and metrics for food delivery gig-workers - as has been done before for workers such as cabdrivers or online freelancers.

Future research can pick up from this point to focus on the efforts of workplace resistance and collective action within gig-work environments and how they take a spatiotemporal dimension. Once instance is the #Logout movements that are taking different forms involving gig-workers and businesses such as restaurants. Moreover, such study can extend valuable insight by conducting global south-south or north-south comparisons of digital platforms and their practices.

A limitation of this research stems from the author's acknowledged positionality as a member of privileged socio-economic class devoid of direct experiences of customary or entrenched forms of labour subordination and servility [52] - as these are rooted strongly in dynamics of caste and status in India. This is a strong line of interdisciplinary inquiry that needs critical and sensitive attention for future researchers to contextualise experiences of gig-workers specific to India.

6. Conclusion

The paper has presented an interpretivist case-study of digital work practices on food-delivery platforms set in south India. The paper contributes 'spatiotemporal justice' as a construct in capturing impact of spatial and temporal control and management which form the core of digital platforms. The analysis demonstrates that (in)justice is involved with workers' being forced to trade-off spatiotemporal risk and stress against benefits of employment. This is contextualised by inequities propagated due to imperfect representation of and asymmetrical information about spatiality and temporality which affect the workers in their subordinated position of power. The paper establishes that micro-spatiotemporal practices and negotiations inherent in digital platforms cause issues for workers such as unpaid labour, unfair income or risky working conditions. Spatiotemporal justice as conceptualised here has direct implications in defining future of work and holding digital platforms accountable by making spatiotemporality a main domain of contestation and claims for justice.

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5.3. Paper 3: Liquid Inclusion: The dynamics of inclusion under datafication and surveillance

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Liquid Inclusion:

The dynamics of inclusion under datafication and surveillance.

1. Introduction

The increasing presence of digital platforms in both governmental and commercial contexts, particularly in the global South, raises questions about their data generative abilities as a matter of concern. Within both ICT4D and Information Systems (IS) research, this ability of platforms to produce and exploit data - called 'datafication' - is important for how platforms impact the socio-technological context that they inhabit, particularly for individuals who are marginalised (Heeks & Shekar 2019). Datafication as a process rooted in the 'Big Data' paradigm, is the transformation of social actions or outcomes into data through online quantification (Mayer-Schoenberger & Cukier 2013, Van Dijck 2014).   Surveillance is intimately connected to platform practices of datafication such as the accumulation of datasets about individuals, understanding them through these datasets, and further even monitoring them or predicting their future within the platform.

Data-driven surveillance is now the most common form of surveillance encountered in public sector services infrastructure and in private commercial platforms. Such surveillance are targeted towards the extraction of value from these data. The surveillance of an individual's behaviour, preferences and social activity is considered a main factor for the success of contemporary commercial platforms and forms a value-creating function of digital innovation (Helles & Flyverbom 2019). Equally, governments mimic corporate 'Big Data' surveillance practices in functions like policing and border control , but also in more benevolent areas of delivering social security and welfare (Lyon 2018).

In the arc of how digital technology has transformed, the advent of 'platform' also adds a layer of complexity in understanding data-driven surveillance. Digital commercial platforms have transitioned from a traditional 'single business' model catering to their clients or a monolithic information system involving their users to a 'multisided' market model. So in a digital platform, multiple stakeholders engage at the same time with sellers and buyers of commercial services transacting in the same digital milieu as citizens seeking engagement with their governments (De Reuver et al 2018). Datafication and surveillance is key part of such 'platform ecosystems' which create a complex impact on those who come under these platforms. Compared to traditional surveillance

mechanisms, data-driven surveillance allows for an easier public-private nexus built on data sharing between various platforms. Thus, surveillance in platform contexts affect the surveilled individuals not only as users of digital platforms but also as citizens and consumers (Van Dijck 2014). This is particularly true for those individuals who are socio-economically marginalised and increasingly depend on both government and commercial platforms for their livelihoods.

Locating itself at this intersection, this paper attempts to query the trajectory of inclusion faced by marginalised individuals as they seek participation into a digital platform ecosystem. Using the empirical case of 'gig-workers' experiences of governmental and private surveillance in India, this paper theorises inclusion as it is performed under the logics of digital platforms. This paper taps into critical research that studies datafication (Taylor & Broeders 2015, Jarrahi & Sutherland 2019, Masiero & Arvidsson 2021), surveillance (Hosein & Whitley 2019, Krishna 2021, Martin 2021) and inclusion (Trauth 2017, Qureshi 2020, Madon & Schoemaker 2021) within various digital contexts. Very relevantly, in this literature, both digital identity systems and gig-work technologies are queried as platforms rendering datafication; yet, largely, surveillance and inclusion have been treated in research as distinct phenomena without addressing their theoretical and empirical overlap. This paper reconciles this gap , acknowledging the duality of digital technology in being both a potential vehicle for delivering beneficial inclusion, and in enacting harmful data-driven surveillance.

Inclusion in IS and ICT4D literature is defined broadly in positive terms as the deploying of information and communication technologies causing a beneficial outcome to those who use it. For instance, early notions of 'digital divide' rather uncritically equated access to technology as being beneficial (Warschauer 2004). Later, when this idea was sought to be broadened, 'social inclusion' was conceptualised as the accessing of both economic and non-economic resources, by participation in society that was aided by technology (Zheng & Walsham 2021). As digital contexts became more complex, it has been acknowledged that inclusion into certain technological contexts can also mean entering an unfair and even exploitative situation (Chipidza & Leidner 2019). Risk of surveillance, data-driven discrimination and other such unfair data practices are frequently surfaced as a pressing problem to address, especially in the inclusion of already marginalised groups into digital society/economy (Walsham 2017, Schelenz & Pawelec 2021).

This paper takes a cue from such research calling to contextualise the complex impact of inclusion and surveillance to present a juxtaposed view. Here inclusion is conceptualised as a construct occurring under the wider practices of the digital platform ecosystem where the marginalised individual has to undergo effects of surveillance and datafication. The research question then can be

presented as: 'How is inclusion performed under the datafication and surveillance practices of digital platforms ecosystems?'.

Inclusion is interpreted within the platform ecosystem using the construct of 'liquid surveillance' (Bauman & Lyon 2013), in which inclusion itself is a direct product of surveillance mechanisms. Set within a south Indian context, the research below traces the trajectory of inclusion when a gig-worker enters the digital economy from being an informal worker. This research is built on an interpretive case study, which analyses the overlap between governmental and commercial 'gig-work' platforms. First, Aadhaar, the ubiquitous biometric digital identity in India, is cast as an identity platform. Secondly, the paper looks at Aadhaar's intersection with commercial digital 'gig-work' platforms of cab-hailing and food delivery.

Aadhaar in the last decade was expected manly as a route to the financial inclusion of the marginalised population of India. The use of Aadhaar as unique biometric mobile and digitally verifiable proof of identity for individuals to establish trust during their online and offline interactions was supposed to help enable the hitherto excluded individuals to participate within the mainstream economy. Moreover, the scheme was positioned by both the government and private technology sector proponents of Aadhaar as a reliable way to bring the large working population of informal workers into the mainstream economy (Nilekani & Shah 2016). As the consequent adoption of Aadhaar increased with millions of Indians enrolling into the system, the context of its application shifted from being identity for government services to commercial services opting to use it as a proof of identity. At this juncture, Aadhaar became a main route of entry into gig-work first as it was needed as documentary proof by the platform and for banks. Then Aadhaar was linked to personal income tax number for all workers, and further it was made necessary for digital payment system.

Existing research presents definitions gig-work presented in varying terms. But within this, a consensus emerges that gig-work is 'paid work' allocated and delivered by way of internet platforms governed by short-term or flexible employment contracts, and performed as time-limited and task-based employment (Heeks 2017a, Graham et al. 2017). Gig-work, commonly seen to be digitally mediated through mobile phone apps, presents a visible face of the contemporary digital economy through brands like Uber and Deliveroo globally or like Ola and Swiggy in India. The 'blue-collar' nature of gig-work as employment, particularly so in India, makes it a predominant route for informal workers to enter the digital economy (FE 2019, BCG 2021). These workers go from a majorly analogue mode of making their living to now working under digital labour practices as gig-workers. Aadhaar enables this transition as the necessary agent of datafication and as a prerequisite for participation in gig-work as

digital proof of identity. All of these entwine Aadhaar with informal workers' experience, from recruitment to their daily performance of work.

Inclusion is seen here in the transition of the worker's status as an informal worker to becoming a gig-worker in three main ways: of seeking a formal documentation and legal identity under Aadhaar, of financial betterment and participation under digital payments, and of digitally mediated formalisation of employment status. Through the analysis of these transitions this paper presents the complex characteristics of what has been termed here as 'liquid inclusion' as being performed under platform ecosystem.

The following section reviews the relevant literature presenting two perspectives relating to digital platforms and their link to surveillance and inclusion. Then the next section presents existing theorisation on surveillance to develop a conceptual framework of inclusion within digital platform contexts. The paper continues by presenting the empirical findings, with a discussion before the concluding section.

2. Review of Literature

This paper straddles two juxtaposed roles of platforms. First, in performing commercial and governmental surveillance and datafication, and second, in delivering a route to the inclusion of marginalised individuals. Research within information systems (IS) majorly studies the first role of platforms, while the second developmental or inclusive role is studied under research on ICT4D.

2.1. Datafication and Surveillance within Digital Platforms

The technological basis of datafication is the complex networked and layered digital components and subsystems that make up the platform. The digital architecture principles of platforms necessarily make the creation of new sources of data and their use within the network easier (Yoo et al. 2010, Rolland et al. 2018). The wider 'platform ecosystem' within which most digital platforms operate is also dependent on data sharing between the different platform entities (Jacobides et al. 2018). The main difference that is acknowledged between digital platforms and traditional organisation or enterprise level digital systems is the ease with which data is created and shared (Chen & Qiu 2019). Considered as 'generativity', the open and modular capability of platforms can "produce unanticipated change through unfiltered contributions from broad and varied audiences" (Zittrain 2008, pg.70). This entails using standard components to ensure interoperability in both the user facing and 'back-end' components.

Wider logics of digital platforms connect the notion of generativity to datafication. Datafication as the production of data is imbricated with the growth of platforms and its ecosystem. Increasing in the platform's scale and its variety of services depends on a market-based exchange of data (Poell et al 2019). In information systems, prevalent research on platforms centres the connection between datafication and generative growth in platforms. They acknowledge that as platforms and their ecosystem grow, the technical features and the underlying business models rely directly on data extraction and commercial value creation (Ghazawneh & Henfridsson 2013, Tiwana 2013, De Reuver et al. 2018, Rodon & Eaton 2021). These studies surface the overarching tenet of how platforms manage their supply and demand for digital services, situated within an interconnected ecosystem. Similarly, when governmental services themselves are platformised, they follow such market-based logics in the delivery of digital services (Henfridsson & Bygstad. 2013). The role of government within the platform ecosystem would also be to extend the reach of the underlying infrastructure of technical networks (Brown et al. 2017, De Reuver et al. 2018).

Wider critical research, majorly studied within global North contexts, has positioned the function of datafication in providing growth and increasing surveillance capabilities to platforms, as a concern (Helles & Flyverbom 2019). Under what Zuboff (2015) famously termed 'surveillance capitalism', the growth of a platform and the accumulation of data generated is, in many recorded cases, to the detriment of some of the most vulnerable individuals in society. She further argues that the conventional 'Big Brother' view of the state or other powerful entity surveilling its citizens 'top down' is replaced with the 'Big Other' of digital platforms. Under datafication, surveillance is not hierarchical but networked, and the powerful don't have to watch over constantly. With datafication 'events, objects, processes, and people become visible, knowable, and shareable in a new way. The world is reborn as data' (Zuboff 2015:77). Wood & Monahan (2019) extend this further that a particular flavour exists to 'platform surveillance' in their transformation of 'social practices and relations' making them 'exploitable as data'.

Newer surveillance paradigms beyond the top-down organisational form then find relevance in research of data-driven surveillance within platforms. For instance, platforms are found to enact 'algorithmic' surveillance with automated decision making about users, like workers within a gig-work platform (Jarrahi et al 2019, Newlands 2021). This is strongly supported by Clarke (2019), who terms that the basis of digital economy is this extraction of data, which acts as a dehumanised representation of consumers, increasing risk of unethical impact on individuals and institutions alike. Similarly, platforms can push for self-surveillance (De Moya & Pallud 2020). Here the basis of engagement with the platform begins with datafication of one's own subjective context and submitting this data as a way to access the platform. Darmody & Zwick (2020) similarly qualify surveillance under platforms as

a manipulation of consumers into a sense of having choice and attaining empowerment, even as they are pushed towards conformity of submitting data, thereby aiding in value creation for the platforms.

Despite the broad theorisation of surveillance within IS research, there is a glaring dearth of accounts that acknowledge contemporary forms of datafication and surveillance in ICT4D research. In ICT4D literature, the framing remains true to its name - a largely developmentalist notion of how contemporary digital technologies can enable positive benefits, which remains the chief line of enquiry in research (Zheng et al. 2018). Even when questions arise of the negative impacts of digital technology on marginalised actors, these are regularly framed as a concern to understand the 'dark' side (Walsham 2017, Bonina et al. 2021). This leaves surveillance, despite being a chief concern, as a side note in such research. As Chipidza & Leidner (2019) present, while discussing the context of technology-led inclusion, the 'reality' of ICT4D technologies includes 'nefarious' means of surveillance. But this reality rarely finds deeper analysis.

2.2. Digital Platform's Role in Inclusion and Development

There is a nascent stream of research within IS and ICT4D that positions the role of digital platforms in impacting inclusion and development within global South contexts (Nielsen, 2017, Walsham, 2017, Koskinen et al. 2019, Heeks 2020, Masiero & Nicholson, 2020, Bonina et al. 2021). Heeks (2020), for instance, presents a 'digital for development' paradigm where digital technology is moving from being 'development tools' to 'development platforms'. They argue that an increasing role of platforms with networked capabilities spanning public and private sectors forms the basis for digital led development within the global South. Digital platforms are also expected to aid in inclusion within transnational and humanitarian contexts, such as helping refugees integrate into society (Madon & Schoemaker 2021). Moreover, platforms are seen to fill in the gaps left by weak governmental institutions and are further promoted by governments as acts of modernisation and digital transformation solely aimed at socio-economic development (Heeks et al. 2021).

Existing research also clearly warns that platforms are not inherently beneficial to those seeking to be part of its ecosystem and have an observed limit as inclusive technologies (Masiero & Nicholson 2020). This paper is positioned at this juncture of academic research. It acknowledges that even as platforms are critiqued for conducting extractive surveillance, they are unavoidable and key to the inclusion of marginalised individuals into an emerging digital economy in the global South. This is seen in many platform contexts. For instance, using the surveillant capabilities, digital identity platforms aim for universal digital-led inclusion as legal and formal documentation for those who are undocumented (Gelb & Clark 2013). Digital payment platforms, on the other hand, are consistently put to use to achieve financial inclusion (Gelb & Metz 2018, Qureshi 2020). Additionally, 'gig-work'

platforms are also considered a major source of employment and potential socio-economic development (Ahsan 2020). Relevantly gig-work has an acknowledged developmental paradigm in acting as a means for inclusion into the formal economy, despite their platform-imposed surveillance and control of work (Heeks et al. 2021).

There is further evidence of the role governmental platforms play in delivering inclusion. While governmental policy and digital transformation efforts apparently seek to build an inclusive platform ecosystem, there are observed exacerbations of existing inequalities or even the creation of newer forms of discrimination (Krishna 2021). As Masiero and Arvidsson (2021) argue, even the underlying design of platforms that are intended for inclusion can have an unintentional 'degenerative' impact, and inclusion is not always a given outcome. Díaz Andrade & Techatassanasoontorn (2021) question the notion of inclusion itself, arguing that inclusion that is solely under digital platforms constitutes 'digital 'enforcement' rather than being a participation that is sought after. Other studies warn of similar deepening vulnerabilities to surveillance within platforms intended for development (Hosein & Whitley 2019, Martin 2021).

Existing debates on inclusion within IS and ICT4D literature shed light on how it can be approached critically. Inclusion, it has been shown, can be experienced as positive outcomes in the use of digital technology and data where hitherto 'unconnected' individuals gain benefits by being part of a digital society (Trauth 2017). Warchauser (2003, 2004) rightly critiqued the idea of a 'digital divide' which presumes that access to technology is always a positive outcome and offers a restrictive definition of inclusion, whereas a holistic 'social inclusion' needs to be about 'full participation' in society aided by technologies. A similar effort to understand the broader context of inclusion is found to have gained prominence within studies of IS and ICTs. Zheng & Walsham (2008) for instance, have redirected the conceptualisation of inclusion as one that goes beyond mere technological provision and call for a deeper attention to socio-political, cultural and institutional factors. Other researchers have echoed this, drawing attention to underlying social factors such as gender, race and class (Trauth & Howcroft 2006, Cushman & McLean 2008, Urquhart & Underhill-Sem 2009). Further research extends this ideation, that the inclusion of marginalised populations into a digital society must acknowledge that there exist sharper impacts of data-driven surveillance and other ill effects such as loss of privacy, unfair exploitation of personal data and unequal outcomes from the use of digital technologies (Gangadharan 2017, Zheng & Walsham 2021).

From a developmental perspective even when inclusion through employment opportunities are created by platforms, exclusion can still occur for groups already facing marginalisation due to factors like gender, disability or age (Heeks 2017b). Platforms' own technological features and business

model choices can still negatively affect its workers even if they are a route to employment. Gig work platforms have been shown to encode exploitative power relations, furthering surveillance & control of its stakeholders (Wood et al. 2019, Malik & Wahaj 2019). Similarly digital identity platforms have been shown to enact exclusion of marginalised individuals despite their aims for inclusion (Masiero & Arvidsson 2021, Martin & Taylor 2021). Noticeably, surveillance as a negative impact and a resulting wider exacerbation of inequalities are acknowledged within such literature. But there is rarely any substantiation on how surveillance itself can be theorised in juxtaposition with inclusion. This is a gap this paper addresses by unpicking the specific contexts of digital platforms as sites of inclusion and surveillance.

There are also calls for research seeking a deeper empirical understanding and a bolder theorisation of platforms themselves as social and technological constructs. As Koskinen et al. (2019) highlight, there is a need to understand the impact of platforms specifically as rooted in global South contexts. They call for researchers to ask 'what a digital platform is and how they should be conceptualised', suggesting an emergent theorisation within IS and ICT4D research in this area, particularly in taking a 'platform ecosystem' perspective. As further argued by Bonina et al. (2021), studying platforms situated within their ecosystem helps broaden the understating of the actors, dynamics, and their relationships – understanding both positive and negative impacts.

In summary, this research argues that despite facing a trajectory of inclusion, this itself can bring vulnerable individuals under technologies that enable surveillance. Acknowledging this proposition helps this paper explore the tensions between inclusion and surveillance as theoretical conceptualisations and within empirical observations. The next section presents the theoretical basis for how surveillance, datafication and inclusion are conceptualised. The paper, in later sections, delves into the backdrop of the research setting and the research methods used before showcasing the empirical findings.

3. Theoretical Framework

This section introduces the theorisation of surveillance under what Bauman and Lyon (2013) present as 'liquid surveillance', based on the theorisation of 'liquid modernity' (Bauman 2000, 2004, 2013). A liquid modern understanding of society considers contemporary notions of modernisation to have transitioned from the 'solidity' that aimed at building stable institutions, creating structures and permanence, to what Bauman terms as 'liquid modernity'. Society is in constant flux, of being 'liquefied' from its solid roots of stability, structure, and bounded bureaucracies. In this way, liquidity captures the conditions of constant socio-technological change within many digital contexts, offering

specific ways to conceptualise platform ecosystems. Below is a reading into the different constructs that such a theorisation offers in placing datafication as a function of surveillance and how inclusion is enacted within it. A particular focus in this conceptualisation is to frame the experience of the individual actor who undergoes surveillance and how this is related to their participation in a broader context of digital platforms and the platform ecosystem they inhabit.

3.1. Surveillant Dataflows

A predominant academic metaphor of surveillance is that of 'panopticon', the architecture of a prison with an all-seeing but unseen guard. Surveillance in the panoptic mode was conceived as the 'gaze' of a powerful watcher over a docile watched individual. The emphasis in the panopticon, as Foucault (1977) interpreted, is on a punitive and disciplinary power over incarcerated or confined individuals who are visible to a powerful entity. While this metaphor captures the imagination of a surveillance based on the active 'monitoring' of individuals, it escapes the conceptualisation of the current era of digital surveillance. Surveillance now is based on systems that are generative of and collect copious amount of personal and behavioural data. This data-driven surveillance forms the basis of almost all platforms that are encountered in contemporary society.

As Andrejevic (2020) argues, in the current era of 'automated digital data collection', surveillance is even more effective than the panopticon as it does not stop at the boundaries of an institution or an organisation. The use of databases and algorithms to enact surveillance on every aspect of the digital society makes the role of a powerful disciplining watcher superfluous. The notion of confinement as central to the panoptic metaphor cannot help explain certain capabilities of the highly networked contemporary digital infrastructures (Bogard 2012). Contemporary surveillance is more about allowing the mobility of individuals within a highly datafied platform ecosystem where their actions and behaviours are recorded. Equally prioritised is the mobility of such data from one platform system to another in the form of dataflows. Unlike the panopticon, data-driven surveillance follows the individual wherever they go within the digital network.

So to conceptualise digital and technological advancements, Lyon (2010, 2016) with Bauman (Bauman and Lyon 2013) conceptualise liquid surveillance as being 'post-panoptic'. As Bogard (2006, *p.106*) puts it, in post-panoptic surveillance:

> … the panopticon has been informationalized; what once was organized around hierarchical observation is now organized through decoding and recoding of information. (Bogard 2006, p.106).

Bauman's view thus goes beyond the disciplinary role of surveillance played by entities like the state in their bounded role as overseer of the citizens. Here, liquid surveillance is characterized by

'dataflows' and 'mutating' networked technological tools and agencies (Lyon 2010). Bauman's liquidity as a metaphor, serves to describe multi-directional flow of data, making the individual visible to many actors within the network through data-driven surveillance especially under the now familiar digital platform surveillance. Bauman centres a certain 'liquefaction' as a property of digital technology - that surveillance and power resulting from it are 'flexible, mobile, seeping and spreading into many areas of life where once it had only marginal sway' (Bauman 2000, Bauman and Lyon 2013, pg. 2).

Bauman and Lyon (2013) further connect specific ideas about digital and data-driven surveillance to what can be understood as a necessity for inclusion under digital platforms. For Bauman, surveillance is intimately involved in the participation of individuals within the society. He argues that individuals are 'denied the capacity of living human life without the surveillance' undertaken through their entry and mobility within the complex network of digital technologies and the dataflows that are generated as a result of this (Bauman 2013, p.50). Echoing the advent of platforms within lives and livelihoods in contemporary times, Bauman contends that liquefaction and surveillance under that 'leak into all aspects of human life'. (Bauman & Lyon 2013). In this way, Bauman explicitly deals with the inevitability of surveillance and datafication due to the ubiquitous nature of platforms and the ongoing intertwining of social life with them.

3.2. Banoptic Self-identification

To further place the role of surveillance in relation to inclusion, we turn, very relevantly to the construct of a 'banopticon' as discussed by Bauman & Lyon (2013). The surveillant function of a 'banopticon' as Didier Bigo (2006) conceptualised here is that the 'ban' defines a notional border that excludes the undesirable populations and includes the wanted populations, along with 'opticon' standing for visibility. As a metaphor, banopticon inverts the enclosed nature of panopticon. Bigo presents that this is an affordance of mobility as opposed to the confinement metaphor of the panoptic era (Bigo 2008). Power is wielded by multiple actors who can choose to be surveillant watchers who can take a step back, afford mobility across the network to the surveilled individual at their whim. This mode of surveillance makes it the duty of the individual to make themselves visible (Nagy 2016 & 2017).

The banoptic regime of surveillance then is seen to be a 'do-it-yourself, mobile and portable, single- person mini-panopticons' (Bauman & Lyon 2013: 73). To be included into a digital network of visibilities one needs to be inside the border set by the banopticon and it becomes their responsibility to be self-surveilled and to keep themselves qualified to remain included. Essentially to be included, the individual opts-in or many times *has to* opt-in to undergo datafication and create an individualised digital presence for themselves. This includes technologies like personal devices, passwords, and other

digital artefacts like online profiles and online/digital identities, including their automation (Lyon 2005). These capabilities were not explained by the confined nature of panopticon (Gane 2012), but the metaphor of liquidity helps conceptualise the function of dataflows. It is this sharing of data that enables the monitoring and tracking even when affording mobility to the surveilled individual across digital platforms and their networks. Within the liquid modern condition as put by Elliot (2013, p. 39) the individual 'has been let out of the panopticon' without losing the surveillant power over them. While the panopticon exerted power by incarceration and its effect of surveillance was permanent, liquid surveillance places a premium on affording mobility and swiftness more than on permanence of their impact on the surveilled.

Banopticon then serves two opposing objectives: inclusion (or 'fencing in') and exclusion (or 'fencing out') (Bauman & Lyon 2013). Bigo (2002) summarises the banopticon as a technology that sorts out who is in and out based on their profile. The surveilled individuals fear is not in being seen by an overseer, but they fear being caught in the wrong place and not being seen when their visibility is needed (Bauman & Lyon 2013, Lyon 2017). The banopticon's socio-technological rules decide this visibility to define 'who are entitled to enter' (Boyne 2000, pg. 287). This ban presents itself through the 'role of routines' in everyday life (Bigo 2014). In all this the banopticon and its ban do not affect all of the surveilled individuals equally. The meaning of the ban, the rules, and its expansion into daily-life is a complex multi-layered phenomenon, affecting various sections of the population differently and resulting in different meanings of inclusion and exclusion (Ajana 2013).

Liquid surveillance then lends itself to understanding inclusion both as a social outcome and as a technological function of digital artefacts. But actual inclusion is not a given under conditions of liquid modernity, as Bauman (2000) presented. It has to be achieved by an individual through 'tasks' of 'self-identification' to signal and claim their belonging in the wider society and thereby be recognised, access resources and connect to broader social networks. In the digital context, this manifests as continuous self-surveillance necessary for an excluded individual as they negotiate the conditions of the ban under the banopticon. Or, put another way, there is a continual need for surveilled individuals to construct their self-identity (Doyle & Conboy 2020). This combined understanding of self-identification and self-surveillance as an ongoing performance by individuals then aids in placing inclusion within digital platforms. It becomes a continual and episodic duty of the surveilled individual to keep visibility and attention over themselves intact and still deal with the outcomes of surveillance, both positive and negative. Without the individual seeking surveillance and allowing the datafication of their lives, work, current behaviours, and gauging of the risk of their non-compliance, inclusion cannot be achieved. While inclusion can be a positive outcome of surveillance datafication, it is seen to be performed under fragmented and episodic tasks of self-surveillance rather

than any absolute utopian ideal of future and of freedom. This is related to the wider context of fragmentation as a theme that run through the writings of Bauman (2000, 2004, 2013).

3.3. Fragmentation

Building on Bauman's (2000, 2004, 2013) ideation of liquidity, fragmentation is most reflected in the praxis of gig-work and digital platforms, where employment is made up of agile and flexible labour working in 'untethered' and 'independent' workspaces (Richer & Richter 2020). This reading of liquidity and fragmentation is but a continuation of what has been said of labour and workspaces, but merely reaching its logical next home under the digital intermediation of platforms ecosystems. There is increasing commodification of labour and disembeddedness of workers from institutions of employment and social protection under platforms (Vallas & Schor 2020).

There is a reflection of this fragmentation in the very nature of surveillance itself. Bauman & Lyon (2013) posit by referring to Bigo (2006) that the banopticon is built on a fragmented and heterogenous assembly of surveillance practice and technologies. It does not depend on the centralisation that was true of the panopticon metaphor. Beyond just a powerful state as a surveillant watcher, the fragmented nature of surveillance affords other watchers. With private involvement in surveillance and including lateral surveillance, a post-panoptic data-driven surveillance is distributed across platform ecosystems. Individuals are put in a position then to accept self-surveillance under the banoptic as well as submitting to surveillant visibility to many others (De Moya & Pallud 2020).

The advancement in datafication and surveillance practices also mean a deepening of the fragmentation, so much so that it is not even an 'individual' who is the site of surveillance, but the datafied representation of the person as a 'data-double'. Liquid surveillance argues that the representation of an indivisible individual as data fragments the human context into a plurality of 'dividuals' (Lyon 2010, Iveson & Maalsen 2019). This is presented as the 'fragmentation of the contemporary subject' under digital technology (Azar 2020). This breaking down of human individuals as manageable fragments of data and a further capability to seek value from data forms the core of digital platform logics. Platforms choose to store, sort, aggregate, analyse and monetise all such dividual data (Poell et al. 2019). Unlike an individual, a dividual is disembedded from their social context. Fragmented data can be reinterpreted without the social context applicable to the individual. Bauman presents this by stating that surveillance practices undergo 'adiaphorization' - the removal of moral considerations within systems and process due to data acting as a proxy for a person.

Understanding the fragmenting nature of data generative surveillance also provides certain further affordance of flexibility to platforms. Flexibility here is to be understood in a plurality of meanings.

Technical design and operations of platform have depended, for their flexibility, on responding with real-time speed on the atomisation of data to the most granular level, and a creation of streams of data that can flows across network (De Mul 2015). Equally flexibility is a business logic of digital platform. The flexibility or a rather enforced flexibilization in supply and demand of labour within business like Uber depends on the atomised nature of the gig-worker (Scholz 2017). This is but a direct result of the workers becoming a fragmented dividual. By retaining control on how the worker's data on their tasks and movement is consumed and interpreted, platforms offer the possibility of flexibility (Wu & Zheng 2020, Krishna 2020).

Contemporary understanding of liquid surveillance is seen to deliver flexibility to both capital and labour contexts. As Abrahamson (2004) and Clegg & Baumeler (2010) present, liquidity can allow for mobile capital and peripatetic labour. This is evident globally, where digital platforms' capital is not tied up in long-term investment strategies of revenue generation like their 'brick-and-mortar' modern counterparts (Cusumano et al. 2019). A liquefied monetisation is evident in the platform as the revenue is primarily generated through data built on episodic digital transactions of individuals. Workers within platforms have equally shed employment as a long-term endeavour and are controlled by short-term contracts, on-demand and just-in-time gig-work (De Stefano 2015).

Based on the reading of literature just done, an idea of inclusion under liquid surveillance conditions can be understood. 'Liquid inclusion' serves to capture the complexity of the purported inclusiveness of digital platforms. Three concepts are core to understanding inclusion in this view. First, inclusion is performed by data at multiple sites by its flow across a platform ecosystem. Second, that individuals seeking entry into platform context encounter the banopticon as a gatekeeping surveillance device. Individuals enter through the banopticon by mechanisms of self-surveillance – of voluntarily submitting their data and thereby undergoing datafication. This is the point where the dataflows are created. The third concept of fragmentation qualifies further how inclusion is carried forward by data. The entity being included is a dividual representation of the subjective human individual. Private and public interests alike are allowed to extract value from these fragmented forms across the platform ecosystem by the creation data-profiles. Liquid inclusion then is directed at producing personal and commercially useful data, enabling easier dataflows between platforms, and in negotiating fragmented changes in their socio-technological contexts.

4. Research Background and Methodology

This paper focuses on the use of data and digital identity across a platform ecosystem within which app-based cab-drivers and food-delivery workers take up employment. The gig-workers studied are

from the major platforms in the south Indian city of Chennai. In food-delivery sector the platforms are Swiggy, Zomato and Uber Eats (including the phase when Uber Eats was acquired by Zomato). The cab-hailing platforms are Uber and Ola. The case background below presents the way in which Aadhaar – the biometric digital identity - uses a platform architecture and presents its connections to gig-work platforms and to the use of governmental and private services by gig-workers.

The ecosystem itself consists of multiple other platforms or systems which interconnect with each other. But from an individual's perspective, the core triad of the ecosystem can be seen as: Aadhaar used as the digital identity, smart phones as the user interface, and a bank account which enables financial transactions. Derived from these, the gig-workers engage with platform services including their work on gig-work platforms. A brief description is given of these constituent parts of the platform ecosystem – with other relevant details presented during the sections where findings are discussed.

4.1. India's Platform Ecosystem

Aadhaar - meaning 'foundation' in Hindi - aims to 'guarantee' each resident a 'digital identity' verified for non-duplication using biometric information. The program is planned and implemented by Unique Identity Authority of India (UIDAI) which acts as the governmental authority overseeing the digital identity ecosystem. Since its inception in 2009 Aadhaar has been a rather novel technology that has gathered various moving parts and increased the range of services it offers along the way. Consequently, Aadhaar's history is an evolving tapestry of changes seen across the years. Aadhaar was presented in 2010 as a means to verify citizens when using governmental welfare and benefits (The Hindu 2010). Aadhaar since then has been used for a variety of services like opening bank accounts, receiving subsidies, or direct benefit transfer (Sarkar 2014, UIDAI 2014a, 2014b). In 2012 the Aadhaar architecture was advanced to enable 'online verification' to be used by private entities, particularly telecom companies and banks (ET 2012). Enrolment itself is 'non-mandatory', and is to be demand-driven by the markets in which Aadhaar is used.

The system works using biometric data – iris scans and fingerprints which 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. The architecture of Aadhaar as a platform espouses an open architectural principle to ensure interoperability. This means that there are standard APIs (application programme interfaces) that define the interaction between Aadhaar's database and other services which seek to use digital identity for verification. Verification of Aadhaar is enabled through API to do two things. First, a verifier who connects to the API can 'verify' if an individual is who they claim to be. Second, the service can also to verify if the demographic and

personal information submitted of the individual to the verified matches the information held on Aadhaar's database. To achieve this online verification, Aadhaar needs to be linked to a mobile phone number, to which a 'One-Time-Password' (OTP) is sent as a security measure. In offline situations and where relevant devices are available, verification can be done by using biometric matching.

The open architecture of Aadhaar as a digital identity platform was further built upon to deliver other API based digital services. This set of services has been called 'India Stack' aimed to be used across public and private sector services and as a basis for digitally-driven financial inclusion (ET 2015, Dattani 2019). Based on this, there has been a growth of Aadhaar-enabled digital payment services, including mobile applications and digital payment gateways, with the services developed, delivered and verified data consumed by multiple private sector players. India Stack has four layers that enable specific interrelated services (IndiaStack n.d.). The first two layers of Aadhaar based verification and management of encrypted 'paperless' digital records and digitised paper documents work together to provide 'Know Your Customer' (KYC) services – the mandatory process of identifying and verifying a customer. KYC is mostly in financial services like for bank account opening, using digital payment services or availing loans but can be used by other sectors too as a verification process. The third 'cashless layer' pertains to a 'unified payment interface' (UPI) which connects banks account with Aadhaar and the linked mobile number to provide digital payment services. In effect, payment using a unique UPI financial identifier can be made and taken by anyone who verifies and links their mobile number and bank account with Aadhaar. The final layer of India Stack is an evolving consent framework named DEPA (Data Empowerment and Protection Architecture). Based on informed consent, DEPA enables data-sharing across services and other platforms which connect to India Stack as 'open personal data store' (IndiaStack n.d.).

The ecosystem under study had 4 different commercial services delivered by their own platforms. These are digital trust platforms, digital payment platforms, credit platforms and gig-work platforms. All of these use Aadhaar, India Stack and KYC services to various degrees (seen in figure 1 below and which are detailed further in the empirical discussion). Trust platform acts as the intermediary between those who seek to provide services or employment to the previously unbanked and undocumented individuals who are now entering the digital economy. These platforms serve the other three platforms described here by undertaking API based verification of Aadhaar and other documentary verifications. Digital payment platforms, used on smartphone apps are linked to both Aadhaar mobile numbers and banks accounts and utilize UPI to conduct financial transactions. Credit platforms utilise the services of both trust and digital payment platforms to provide direct access to loans for its users. Finally, gig-work platforms are connected to services from the 3 others. Gig-workers are verified using Aadhaar and other documents using trust platforms when they take up employment.

Workers undertake digital payments for their daily work and interaction with customers. Credit platforms that use digital payments, and in partnerships with gig-work platforms provide loans to gig-workers. On top of these commercial services are the newly established eSHRAM portal for building a National Database of Unorganized Workers (NDUW) of India's unorganised workers (EShram n.d.1). For gig-workers, an Aadhaar linked registration on this portal is mandatory to be considered eligible for upcoming social protection schemes like old age pension.

This complex interaction of the constellation of platforms are represented below with examples of each of the platforms (figure 1).
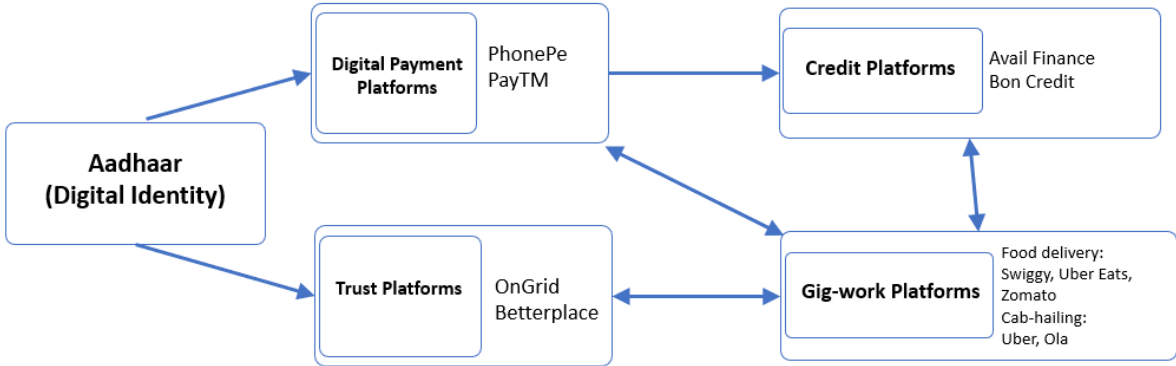
The various platforms with their examples are as connected to Aadhaar and Gig-work.
The arrows depict the functional connections and flow of data between platforms.

Figure 1: Platform ecosystem (showing Aadhaar and its connections to various platforms – with examples of platform companies. The arrows depict functional connections and dataflows).

4.2. Methods

This paper uses an interpretive case study (Walsham 1995, Barrett & Walsham 2004) to triangulate qualitative data from various sources. Primarily, the data collection was done by semi-structured interviews in two phases (see table 1) 17 cab-drivers (including two union leaders) and with 27 food-delivery workers. The cab-drivers were interviewed between January to March 2019, and the food-delivery workers were interviewed between December 2019 and February 2020. Snowball sampling was done with initial contacts through the personal connections of the researcher.

Other ethnographic and auto-ethnographic observations also support the interview data. The primary researcher conducted auto-ethnography in two ways – by undergoing the enrolment process for Aadhaar and working as a part-time food-delivery worker over 6 weeks. This presented an

opportunity to directly observe various parts of the platform ecosystem as a worker and as a consumer. The researcher undertook enrolment into the digital identity program, linkage of digital identity with bank accounts, mobile numbers, and vehicle registration. This was followed by research as a food-delivery worker undergoing recruitment, on-boarding and daily work processes using digital payments and gig-work apps. Given the congruencies of processes and technologies between cab-hailing platforms and food-delivery platforms, the observations done are mostly applicable to both types of gig-work platforms. Further observations were done in situations like visiting platform gig-worker support offices (done as gig-worker), attending gig-workers union and association meetings (as a researcher), and within Whatsapp groups (used by the researcher as a gig-worker).

Interview type (number of instances)	Anonymised reference	Dates
Cab-drivers using ride-hailing apps (15)	CDA 1 to CDA15	Phase 1 interviews conducted between January to March 2019
Cab-drivers union leaders (2)	CDL1, CDL2	
Food delivery workers in platform A (13)	FDA1 to FDA13	Phase 2 interviews conducted between December 2019 and February 2020
Food delivery workers in platform B (10)	FDB1 to FDB10	
Food delivery workers in platform C (4)	FDC1 to FDC4	

Table 1: Interviews Phases and Details

Almost all the interactions were conducted in the Tamil language, of which the researcher is a native speaker. Visual aids were used by taking photographs, videos and audio recordings during interviews and observations (where consented). Further notes, both as memo audio and written as a form of research diary, were used. To contextualise the collected data, textual sources such as articles, technical blogs, and policy documents published by government, platforms, and media were used where appropriate. All data were originally in or are translated into English, transcribed where appropriate and thematically coded.

In this research, the data analysis was done using a combination of deductive and inductive approaches. This entails an iterative reading of theory and examination of data. As an approach, taking a combined deductive and inductive approach places a premium on the reflexive position of the researcher. Coding was done first with the broad themes sensitised (Flynn & Gregory 2004) by surveillance, inclusion and datafication based on the theoretical standing used in this paper. The table

below (table 2) shows the hierarchical view of codes grouped into sub-themes and overall themes. Specific codes were developed under these broader themes. This resulted in emerging patterns due to codes coalescing around themes such as of identity, income and work. For instance, the idea of 'providing Aadhaar as identity proof' was commonly found across many contexts. But deeper probing of the contexts qualified further the data where Aadhaar was used in private contexts with banks (1.2), was used as a paper document informally (1.3), found to be used by other platforms for credit scoring (2.1) or used directly by workers in registering for government benefits (3.1). The codes themselves were further grouped or retired based on their explanatory value. These multiple instances of similar codes were logically grouped into themes and subthemes. This grouping was also sensitised by the different meanings of inclusion. This structure is reflected in the empirical section below.

1. Datafication of identity
1.1 Data aggregation by platforms
• Absence of consent in sharing data (initial years)   • Database of personal records for 'blue collar' workers across the ecosystem
1.2 Self-surveillance practices
• Platforms push to submit Aadhaar as mandatory during onboarding/registration   • Time limited OTP based verification for each transaction   • Regular KYC process for multiple services
1.3 Sharing personal data
• Paper use of Aadhaar to verify and submit personal information   • Verification of personal data shared across systems/platforms
2. Profiling and sharing of financial data
2.1 Creation of worker financial data profile
• Eligibility for private services calculated based on gig-work profile   • Incremental data forming an income history
2.2 Marketing of credit to workers
• Gig platform marketing loans as benefits during onboarding   • Personal loans and vehicle loans linked directly to gig-work platforms
3. Gig-work as formalisation
3.1 Data sharing across platforms
• Government portal registration under Aadhaar   • Portability tracking for workers moving across platforms   • Demographic data sharing across government portal (eShram)
3.2 Gig-workers welfare opportunities
• Aadhaar as eligibility criteria for availing governmental welfare   • Platform and government-imposed definition of 'gig-work' productivity for welfare eligibility   • Gig-work positioned by national digital strategy as formalisation

Table 2: Themes, Sub-themes and Codes.

5. Findings:

The evidence shows three specific fronts in which the workers seek inclusion and the betterment of their livelihoods. Under digital platforms, impacts of datafication and surveillance play out on all these three fronts. First, as many gig-workers emerge with a digital clean slate from a previously disconnected background, they necessarily seek inclusion to establish a formally documented and online identity with which to participate in the digital economy. Secondly, the inclusion sought after is in the financial domain through formalised banking. As their erstwhile informal work can rely heavily on cash transactions, many such workers have been 'unbanked'. Inclusion here is to seek betterment in income levels and access credit based on their participation in digital payment and other financial products within the digital economy. The third front inclusion emanated from gig-work as a mode of employment and its links to formalisation. Aspects like data-driven surveillance, algorithmic control of gig-work and sharing of data within the platform ecosystem precipitate the impact of datafication on the workers.

5.1. Performance of Identity as Transactional Data-Profiles

Aadhaar is tied to evident governmental actions for digital-led inclusion under 'Digital India' program through universal access to online services built over an integrated data infrastructure. The digital identity acts as the 'pillar' of digitisation and as an entry point for the inclusion of the previously un-digitized or under-digitised individuals within Indian society. Data linked to Aadhaar and the identity itself act as banoptic technologies. When Aadhaar gathered other moving parts and became part of IndiaStack, the platform ecosystem consisting of private and commercial platforms used Aadhaar to establish digital identities for those to enter the digital economy. This, as a 'paperless' future promoted under India Stack, was to be achieved from Aadhaar's functionality of possible online 'verification'. The verification of personal data submitted by workers within the platform ecosystem enables it to be shared onward

The transition from identity cards as a long term solid institution to verification of data at every point of use reflects how the durability of older forms of single-use and documentary proof is datafied and fragmented under platforms. This is reflected in the experience of workers. Fragmentation of identity is set in motion even if the workers still refer to and engaged with Aadhar as a rather solid documentary proof:

> Aadhaar card gives me an identity document, like a certificate. It is good as it is acceptable everywhere. I don't have to run around for this and that document. (CDA11).

This is because a vision of legal inclusion is defined under Aadhaar's datafication regime with the identity used as both a paper 'card' – much like the previous identities, and as a datafying 'digital' identity. This hybridity helps achieve data-driven surveillance.

The underlying ethos was that Aadhaar as a 'digital' banopticon would enable the participation of the millions of new individuals by providing dependable data despite their previous analogue lives. This is evidenced in the formal process for checking the data, digital and documentary proof called the 'know-your-customer' (KYC) check. KYC is instituted and mandated legally at banks and for digital payments. The author had to provide Aadhaar as a document and undergo biometric verification as a formal requirement for opening a bank account. KYC using Aadhaar as a document or digitally provided as 'Aadhaar number' was a prerequisite before the registration of digital payments and for vehicle registration. The linking of Aadhaar for income tax accounting purposes with the 'permanent account number' (PAN) was also a necessary step. As the interviewees narrate, all these services are essential for both cab-drivers and food-delivery workers, and they see it being linked directly to a need for Aadhaar:

> Aadhaar is asked at each stage. Without which nothing moves. The first two document when searching for this job is always PAN and Aadhaar… The companies even sent us notifications to ask to submit this regularly. (FDA7).

> All job advertisements for drivers [online] always mention Aadhaar is needed these days… The [platform company] ask for it along with PAN card and driving licence… (CDA8)

Alongside these mandated uses of Aadhaar, the workers are pushed officiously in sharing their Aadhaar for verification in other situations. This was observed commonly in instances when purchasing a mobile phone subscription and when joining as gig-worker. In both cases, Aadhaar is merely voluntary. But in telecom and gig-work offices, the list of documents prominently mention Aadhaar as the main 'document' as seen by the author. It is observed to be insisted during the recruitment process as a necessary document despite the 'voluntary' status in law (author observation).

Along with the submission of Aadhaar as documentary proof, registration of digital payments is an early step in becoming a gig-worker. All workers have to necessarily make a digital payment of an initial amount for their gig-worker uniform, delivery bags or other work accessories. This registration for most workers as new entrants into the digital economy is done with Aadhaar as the proof, and in many cases, the digital payment registration is done at the gig-work recruitment office.

The platform companies use the documentary copy of Aadhaar to verify the data provided by the gig-worker. Gig-workers have mentioned that they were asked to undergo a one-time-password

based verification. On discussing their understanding of the requirement for Aadhaar while joining gig-work, there is clear evidence of verification actions as workers mention:

> When I joined [in 2017] they told me during [onboarding] that I would receive multiple OTP for verification [of Aadhaar and digital payment]. They did everything as it was needed to be done before I start. (CDA8).

> Even before going [to food delivery platform's] office, you need to register with OTP [for digital payment] to pay [the platform company] for the T-shirt and bag… Only then with Aadhaar, [driving] license and bike documents, everything ready-in-hand, you should go… (FDC1).

From a surveillance perspective, inclusion under Aadhaar enables directly the datafication of the workers' livelihood in the gig-work platform context. In all of the cases examined, even though Aadhaar was presented as a paper or scanned documentation by drivers or food-delivery workers, it enhances the platform's database by ascertaining the quality of personal data submitted by the workers. In effect, Aadhaar as a standalone document is not sufficient proof in almost any of its linked uses. There is a need for transactional verification of data at multiple points. These, as acts of 'self-identification', generate and enable flows of data within the platform ecosystem to reliably profile the workers over time.

This broadly matches the changes in how Aadhaar as an employee verification platform was positioned after 2016 – using what was termed 'digital trust platforms'. These emerged as the reaction to the issue of 'safety' of cab-riding customers. This issue garnered wider interest, specifically within the information technology sector and its technocratic community related to the IndiaStack set of services (Business Standard 2014). As a result, the need for Aadhar and other verification for gig-workers became normalised.

The clients for such verification services naturally included almost all major gig-work platforms studied here (Ola, Uber/Eats, Swiggy and Zomato). This essentially meant Aadhaar as documentary evidence was collected and shared with trust platforms to undertake on-boarding checks. Trust platforms depend on consent for this verification. But this is also a step removed from the gig-worker as in the example of OnGrid, the trust platform that takes consent from their 'client', which is the gig-work platform – and not the gig-worker. This is seen as mentioned in OnGrid's privacy policy for platforms (OnGrid n.d.)

> I agree to OnGrid Terms and Conditions. I have taken the consent of the individual for using his/her Aadhaar number (if Aadhaar number is provided) and personal information for Aadhaar authentication (if Aadhaar number is provided). Further, I have taken the consent of the individual for using his/her personal information for identity verification and background checks… (OnGrid n.d.)

In such practices of consent that involve intermediation by platforms, the gig-worker may not ever be informed about the process of the context of their personal data being out to use. Thus, gig-workers' personal data is directly commoditised.

The gig-work platform becomes a conduit for dataflows by passing on personal data of workers creating value for both itself and the trust platform as commercial entities. So, just the submission of a paper copy of Aadhaar can in fact start a datafication process across platforms without the informed consent of the individual. This function of Aadhaar as a permanent digital identifier but only used to qualify a datafication process for 'blue-collar' workers is clearly acknowledged by OnGrid. They present Aadhaar as a way to build a transactional and incremental data profile, and there by ascertaining workers' qualification to continue within the platform ecosystem:

> Aadhaar has now been issued to 104 Crore people in India, and since the 12-digit number does not change over an individual's lifespan, if all [workers] are verified and registered using one common network, Aadhaar helps in unification of "incidents" and "reputation" of professional, thus enhancing accountability. (OnGrid 2016).

The data generated within the onboarding and verification process creates a record for the workers where one was not available before, defining their future profile within the ecosystem. Some of these trust platforms vie to be the 'Linkedin' for blue-collar workers (Deccan Chronicle 2018), but without the personal control of data that elite social media affords. As the terms and conditions of another trust platform reads, addressing the 'blue-collar' workers as its users:

> Personal Identification Information: At many different points of time while using our platform, you may be asked to provide personally identifiable information. We seek or collect, amongst others information such as your name, mother's name, father's name, password, date of birth, gender, signature, marital status, nominee details, email id, phone number, educational qualification, bank account details, any other Information that you provide during your registration process or to use any services etc. That helps us to confirm your identity and facilitate provision of the Services through our platform… In case you are required to provide any proof of identity card (Voter ID, Driving License, Aadhaar etc.) details to us during account creation, you acknowledge and agree that the act of providing your identity details to us is voluntary. (Betterplace n.d).

These services becomes a banoptic tool created within the platform ecosystem to know and qualify the workers by aggregation of their transactional data in the longer term, which becomes their online identity. None of the workers interviewed were given information by the platform companies on how their Aadhaar data or such linked data profiles were to be used beyond the initial submission as documentary proof while enrolling for gig-work.

5.2. Dataflow-based Financial Inclusion

Digital payments apps have replaced cash as the predominant mode of purchase for gig-work services. Workers across the studied 5 gig-work platforms are mandated to transact with the platforms only using digital payments. This has implications for how workers engage with their income within the gig-work platforms and how this affects their financial profile within the platform ecosystem.

The move to digital payments is an ideal option for the platform. It enables real-time surveillance of workers' payments and aggregation of data about customer spending and platform revenue streams. Digital payments act as the intermediary for the interactions between the worker and the customer. For the workers, this means that their payment of gig-work commission and any incentives become an algorithmically controlled stream of income aggregating over each task, daily, weekly and monthly. Several workers cited this apparent fragmentation of income and their lack of direct control as one of the main reasons for their experience of vulnerability as a gig-worker. As one of the cab-drivers puts it:

> I just get the money directly into the bank… When I was a [salaried driver] I know how much I can get at the end of the month and I can plan ahead. But now [as a gig-worker] I have to calculate regularly to make sure I can afford to pay due. Keep looking at when the money comes in to the bank. (CDA5).

As similar idea is shared by a cab-driver who used to drive an auto-rickshaw before becoming a gig-worker:

> When I was an auto-driver I have to keep finding rides to make sure I can earn enough in a day... Even the due [for the loan of auto-rickshaw] is fixed. I don't have to give commission to anyone. It's not like [work as gig-work cab-driver]. I can never say for sure this is how much I will make in a day… If I get the ride its good. I can see how much they take and how much they give me. (CDA15).

This loss in control of their income goes against the governmental position on digital payment that a 'cashless' future would be a financially inclusive one (Carriere-Swallow et al. 2021). Aadhaar is involved directly with this narrative of financial inclusion in enabling registration for digital payments simply by having a digital identity with a linked bank account and mobile phone number. This datafication of income under digital payment system as per the Reserve Bank of India (RBI 2019) is set up to account for cash-flows within the informal sector. This directly applies to gig-workers as they are primarily informal workers who have now become independent contractors under platforms.

The experience of workers with digital payments also highlights an issue within the gig-work platform ecosystem. Gig-workers have been pushed towards 'cashlessness' and even presented it as an inclusive idea. In this, the practice of digital payments within gig-work is geared towards delivering

convenience to customers. Interviewees mention the multiple digital payment options that are clearly mandated by the platforms the worker has to support to present more choices for the customers. Ultimately, this convenience of digital payments marketed by the platform comes at the cost of the gig-workers workers managing the gaps in datafication. For instance, when the customer exercises their option to make payment in cash, the worker is expected to regularly deposit this cash into the platforms' account. This causes direct inconvenience without providing any benefit to workers of being in a cashless digital economy.

Related to Aadhaar and digital payment is the issue of credit as a common topic that surfaced among the gig-workers. Recalling reasons why they sought Aadhaar, they point out that Aadhaar was positioned to them as an opportunity to access formal banking and its benefits. Gig-workers cite governmental mass media marketing and word-of-mouth influences in considering Aadhaar an important proof of identity to access credit in the form of bank loans. As one of the food-delivery workers mentions:

> All of us have been asked to give Aadhaar to bank as proof… We are hoping that some opportunities to borrow for like bike or personal loans in the future. (FDA1).

This expectation echoes India's central bank and the government's use of Aadhaar as the pathway to access credit and as an important paradigm of financial inclusion (ET 2015).

For gig-workers, access to credit is related directly to their datafication experience. During the author's interaction as a gig-worker within the on-boarding and recruitment process, opportunities for availing loans are presented by the platform as a benefit to the worker. This was discussed alongside the food-delivery companies' income schemes and how payment would be made to workers.

In this context, digital platforms facilitate two forms of credit: personal loans or lower amounts as a form of commercial micro-credit. Personal loans are mainly for the purchase of vehicles or expenses at a similar level of monetary value. Unlike in the UK, most food delivery gig-workers in India need a motorcycle or a scooter to undertake their gig-work employment. The platforms partner with banks and other financial institutions to provide loans directly to the workers based on documentary evidence. Here the loan repayments are made directly from the platforms to the banks and financial institutions, deducted from the earnings of the gig-worker. For the workers, financially this is very similar to their previously informal leasing of vehicles, but it is formalised in its repayment mechanism. As a cab-driver says:

> I used to pay cash to the [cab] owner before daily or weekly as a due. Now we pay both due and commission to [the platform], which they take automatically. (CDA14).

This is done in a bid to mitigate risk to the lender in providing credit to the gig-worker with their self-employed and atomised status under the digital platform. This control of access to credit is a vital function for the platforms. Even when personal loans are closer to traditional credit options financially, due to the lower or absence of credit ratings, they almost always involve Aadhaar based verification and the use of digital platforms' data on work and earnings history submitted to the lender.

Within the platform ecosystem, the dataflows provide business capabilities for specific gig-work adjacent businesses which operate as a credit marketplace for gig-workers. Here the workers' data becomes the focus of provisioning credit through what has been termed 'flow-based credit' platforms (OMI 2021). Flow-based credit builds on processes similar to personal loans, but they are geared towards a credit being offered from as low as INR 500 to a lower maximum than personal loans (e.g INR 40000). The most common way flow-based credit works is within a digital marketplace, enabled by data-sharing governed by gig-workers' algorithmic profile, used in lieu of a traditional credit score or history. Ola, the ride-hailing app company's research thinktank explicitly position the use of transactional data as a route to financial inclusion:

> In order to let the platform economy - i.e. the economy of jobs - really flourish, it is essential to also enact policy reforms on the monetary and fiscal fronts, such as access to credit and finance for those associated with platforms. By using transactional data available on platforms, the government can promote financial inclusion, especially to those that are new to credit. (OMI 2021, pg. 18).

This imagination of the inclusive financial future is tightly coupled with overlapping governmental, private, algorithmic and data-driven surveillance, even as platforms push for their own generative growth.

This data sharing is also part of the ongoing contract between the gig-work platform and the gig-worker. The practices of data sharing may actually be opaque to the worker. Workers seek these loans from within the gig-work platforms' own offerings, which then is routed through specific flow-based credit platforms. As one of the food-delivery workers recalls:

> I got a notification that 'now you can get loan from the [platform company]… [I] clicked on the loan option in the [gig-work app]. It opens a new app… It asked for many [permissions] and I also have to send my document details… [The flow-based credit] app shows how much eligibility I have… (FDA1).

Flow-based credit platforms within the ecosystem have very close tie-ups with gig-work platforms. For instance, Ola is an investor with 'Avail Finance', a flow-based credit platform (OMI 2020). Ola partners with Avail Finance for the provision of a 0% COVID-19 support scheme called 'Ola Sahyog'. Here a micro-credit of up to INR 5000 is made available to 'pre-approved' cab-drivers (OlaCabs 2020). But in other cases, Avail Finance charges from 1% to 2% per month to such micro-credit loans. Avail Finance,

through the use of the technologies of India Stack, is also in partnership with other major gig-work platforms such as Swiggy and Zomato (ET 2019). Avail Finance thus works in strategic partnership with gig-work platforms, which entails investment and data sharing agreements. Based on this Avail Finance presents its mission as

> Currently, in India, the blue-collared workforce which includes, but is not limited to, domestic help, cooks and drivers, has very low salaries, no cash reserves and few, if any, liquid savings. This segment has no credit card penetration, no credit history, and a very low [credit] score, which leads formalized lending institutions to never consider providing them with loans, when they would seem to be the segment that may require loans the most... Not only that, but Avail's low interest personal loans also help one build a credit history through timely, simple repayment. (Avail Finance, n.d.)

Essentially, the flow-based credit platforms and lending agencies seek a digital profile to gauge creditworthiness algorithmically from the data and transactions (India FinTech Forum 2020). Availability of credit then depends on algorithmic profiling of the gig-worker using data generated by the worker's use of multiple layers of technologies: data on the gig-work platform of the worker's productivity, Aadhaar verification, data from the wider IndiaStack offerings, and the aggregated digital payment transactions of the gig-worker.

An extension to current digital credit practices is a function built under the aegis of DEPA – the consent framework part of IndiaStack (NITIAayog 2020), to enable a 'flow-based credit'. This is understood as the ability for financial services to define parameters of credit worthiness based on the projected cash flows of any individual. Credit here is built on convergent 'data-flows' (IndiaStack n.d., Sahamati n.d.). This approach enables the use of data that flows through multiple platforms within the ecosystem. At each stage with increasing aggregation of data about the gig-worker helping create a profile – which has been presented as a necessary route for inclusion into digital society (Nilekani 2016). The main issue here is that as a combined public-private entity, DEPA allows marginalised groups to get greater access to online services by sharing data about their livelihood to a potential loan provider. In place of a formal credit score, this is supposed to allow the loan provider to gauge their own risk in engaging with this particular marginalised individual.

A clear rift arises here between those who have access to formal credit in society versus the marginalised but digitally included individuals like gig-workers. The issue here is that the already marginalised individual will be put at more risk of the many subjective assumptions that create this profile across the platform ecosystem. Where financial and legal standards for credit scoring exists in formal banking systems, the enabling of these alternative credit scoring practices are specific, algorithmic, so it would be opaque and proprietary to the platforms that create such scoring.

5.3. Fragmented Formalisation and Welfare

Gig-work platforms have been positioned as a route to formalisation of employment by both governmental programs and within the platform companies' own strategy. While this is an attractive proposition of inclusion, in practice the purported formalisation is antithetical to gig-work's core tenet: the flexibilization of work.

The bid to formalise the informal sector is linked with the implementation of digital identity platform and its use within gig-work platform ecosystems. Governmental policy in India differentiates gig-work sectors from the other defined informal sectors in which a minimum social safety net is not available. Recently the union government has specified a route for inclusion of defined gig or platform workers within the new Ministry of Labour and Employment's Code for Social Security in 2020 (MoJL 2020a & 2020b).

> As the economy develops it is expected that more number of informal sector workers may gradually move towards formal sector. The Government is aware of this fact and, therefore, it is in the process of including such unorganized workers under different schemes through the proposed Code. For example, the Code has already proposed a separate scheme for gig and platform workers. (MoJL 2020b, pg. 142).

This code provides a route for insurance and old-age pension benefits for gig-workers. This delivery of benefits is built on the aggregation of data, from across the platform ecosystem, of the worker's status.

The datafication of both digital identity and work within gig-work platforms is also intimately connected with the strategy of formalisation under the overarching tenet of the 'Digital India' program. The strategy presents the following aims, which link gig-work platforms and Aadhaar in operationalising the inclusion of informal workers:

> Universal coverage of digital identity… Digitised data assimilated… Dematerialised, digitised, disintermediated processes to empower consumers and businesses… More workers in the formalised, digitised sector via tech platforms and value chains… (MeitY 2019, pg. 19).

A similar meshing of employment and digital identity is seen when informal workers face a national strategy of banoptic surveillance. Here, linking Aadhaar and the exporting of data generated by gig-worker within platforms is deemed necessary for the formalisation of gig-workers' employment conditions. These surveillant dataflows are seen in two related governmental efforts. The governmental employment portal listing 'blue-collar' work made Aadhaar mandatory for registration as early as 2015 (YourStory 2015, ENWeekly 2015). More recently, the section within the Code on Social Security in 2020 (MoJL 2020a & 2020b) that addresses gig-workers' eligibility mandates the linking of Aadhaar for any future establishment of pension and other social welfare schemes.

> Every eligible gig worker or platform worker… shall be required to be registered with Aadhaar, on self-declaration basis in the form on the portal, as specified by the Central Government…(MoJL 2020a, pg. 152).

The linking of Aadhaar and gig-work platforms here is expected to provide visibility of the informal sector to the government through the linking of demographic data of the workers and is a facet of a pronounced banoptic function.

Further, the connection between the potential formalisation of work conditions and employer-employee relationship is defined by regular data-sharing between the government and the gig-work platforms. The data generated by the workers within the gig-work platforms on their work productivity and level of income have a direct bearing on their formalisation process and inclusion in social protection schemes. As the draft rules for the Code on Social Security reads:

> For identification and smooth registration of eligible gig workers and platform workers, each aggregator shall share monthly or such other periodicity… details of the information of their gig workers or platform workers electronically… (MoJL 2020a, pg. 152).

The fragmented nature of gig-work flexibly defines social welfare and does not act as a floor of social protection. The extent of social benefits that the workers are eligible for is linked to the actual performance of work within gig-work platform. The gig-workers' eligibility for social security and the quantum of financial contribution that digital platforms (or 'aggregator' as mentioned in the rules) bear towards workers' social security are both defined by the number of hours worked by the gig-workers on a platform (MoLE 2020). The eligibility criteria state that:

> A gig worker or platform worker, who has completed the age of sixteen years, but not attained the age of sixty years, shall be eligible for registration as mentioned in clause (a) above: Provided such worker has been engaged as gig worker or platform worker, for not less than ninety days during the preceding twelve months. (MoJL 2020a, pg. 152).

The main shortcoming here overlaps with the flexibilization that is already afforded to platform companies. The productive work of gig-workers under algorithmic control is defined by data practices of platforms, where gig-work is measured in granularly timed and fragmented tasks. Put another way, while the actual income calculation for both cab-drivers and food-delivery workers are controlled in cycles of days, weeks, and months, the measure of productivity and income is counted in minutes and is delimited by a task. A definition of 'day' in this context is nebulous. Unlike a standard 8 hour day or 40 hour week used in formal employment, gig-work is never quantified in actual measures of days of labour. These conditions already work as contractual escape clauses for platforms in triggering

conditions that do not guarantee hourly or minimum wage for gig-workers. This is the context where a definition of 'ninety days' as eligibility for social security lacks clarity.

This is reflected in the responses from gig-workers' unions and other organisers who seek to make changes in the social security code to provide further voice and control to workers themselves. As the gig-worker union's leader mentioned in an interview commenting on the social security code:

> Already the [platform companies] manage closely daily work actions of the workers. This change in law provide the companies with more options to influence employment in longer term… [Gig-workers] who work with multiple platforms also would need to keep making sure that their data is properly reflected to maintain eligibility. (CDL1).

In fact, unlike their counterparts in other states, this union has asked its members to 'wait and see' the impact of registering on the government eSHRAM portal for informal workers. Other labour organisations have raised a similar point:

> Platform workers may work for several aggregators simultaneously, and be engaged as workers for intermittent and irregular periods of time. As it stands, the Draft Rules do not address how the minimum period of 90 days of being engaged as a platform worker is to be calculated — a mandatory eligibility criteria for registration under Rule 50(2)(d). It also does not outline how the number of days worked impacts the nature and extent of social protection that platform workers are eligible for. (ITforChange 2020, pg. 3).

A justification for the flow of data between gig-work platforms and governmental portals is also to track the portability of the benefits provided to the gig-workers. The objective of the governmental portal presents the following: eSHRAM Portal:

> Creation of a centralized database of all unorganized workers (UWs) including Construction Workers, Migrant Workers, Gig and Platform workers, Street Vendors, Domestic Workers, Agriculture Workers, etc., to be seeded with Aadhaar… Portability of the social security and welfare benefits to the migrant and construction workers. (EShram n.d. 2).

This is a direct function where data-driven surveillance is cited by the government, enabling qualified mobility to gig-workers in the future, across platforms and even across geography. Labour organisations expect challenges ahead in this portability function as platforms retain control of the data and how it is transferred to the governmental portal. The worker can only influence this process by registering for the governmental portal. Workers do not have direct control or visibility yet, of how aggregated data on their daily work within platforms is consumed within the platform ecosystem. In this way, the flexibilization within gig-work experienced by the worker - as uncertainty in everyday work conditions and the assurance of employment, now will be extended to the realm of social welfare.

6. Liquidity and Inclusion: A discussion

This paper presents a clear grounding of the role of surveillance as a necessary point of contention for those who seek inclusion into the digital economy. The construct of banopticon used clarifies the role identity and data play in creating both opportunities for marginalised individuals and vulnerabilities due to imperfect governance. Within this context, the discussion on individuals' experience from seeking digital participation to undergoing algorithmic profiling demonstrates the dynamics of inclusion and exclusion under the multiple logics of digital platforms. Here the conceptualisation of what can be termed 'liquid inclusion' under platformisation shows that participation within platforms and uses of its constituent technologies are not the end for inclusion. There is a need to recognise the actions needed of individuals who perform what Bauman (2000) calls 'tasks' of 'self-identification', or from a surveillance perspective, perform 'self-surveillance' to establish their credential to be included within the digital platform ecosystem. This reconciliation of inclusion as a function of platform logics and data-driven surveillance adds to the limited literature stream that centres digital platforms' inclusive potential (Malik & Wahaj 2019, Bonina et al. 2021, Masiero & Arvidsson 2021).

The paper conceptualises inclusion under the practices of datafication and surveillance within platform ecosystems. The case study chosen straddles both public and private sector use of digital identity and data by observing the specific context of gig-workers and their intertwined use of Aadhaar and other private commercial platforms. By choosing liquidity as a lens, the paper demonstrates a necessary theoretical framing that can contend with data generative capabilities of digital platforms and how this capability intersects with the inclusion of marginalised individuals. It adds to the growing interest of liquid modernity as a way to frame the analysis of information systems (Bryan 2020, Doyle and Conboy 2020). The theoretical construct used here also adds to the growing literature in information systems and ICT4D that focus on the platform approach (De Reuver et al. 2018). Further, by examining the specificities of gig-economy workers, it answers calls for a need to understand platforms within the global South context (Koskinen et al. 2019, Heeks 2020); and explore the developmental impacts of gig-work platforms (Heeks 2017).

Liquid inclusion, as seen here, has specific characteristics. The nature of inclusion within the platform ecosystem is guided by a trajectory of individuals entering the platform ecosystem recast as a 'dividual' of their data under banoptic surveillance processes. The banopticon's function is to prioritise mobility within the ecosystem to those who can advance commercial value creation and exclude those who cannot. Inclusion then seems to be flexible and emergent across multiple layers of such banoptic technologies that utilise the fragmented nature of data. It is with their capability to produce and engage with data useful for the platforms themselves, that individuals such as gig-workers

can continue to be included. This mirrors what Bauman (2000) mentions in an earlier work, where he argues that technology does provide the individual with a 'de jure' inclusive participation in society. It is a function of the banoptic surveillance processes that deliver inclusion in practice. Turning 'de jure' into 'de facto' inclusion is an ongoing process for the individual to seek self-surveillance by sharing mandated data and ensuring that their 'self-identification' remains continuously valid. In this point, this paper perhaps echoes Orlikowski's (2000) distinction between 'espoused technologies' vs 'technologies-in-use'.

Particularly, platforms rely on the liquefication or fragmentation of individuals' socio-technological context as a means of data-driven surveillance. This is seen in this research in the datafication of workers' identities. Erstwhile 'solid' artefacts like identity cards were more durable constructs defining a person and their claim to participation within the social milieu as an individual. The datafied and dividualised equivalent is seen under Aadhaar, where the digital identity is an underlying construct connecting multiple data points about the individual distributed across the platform ecosystem. Identity then is liquefied as an episodic and ongoing verification of personhood, performed by the transactional and incremental creation of a profile.

The liquefaction of identity is supported by fragmented income generation and employment contexts. The entwinement of identity with various datafication process across the ecosystem become triggers for the production of data and dataflows, which can then be extracted for their commercial value. Whereas solid surveillance of work and identities needed long-term commitment, this fragmentation affords a lightness of capital that the platforms seek. Bauman's (2013) thesis of modernity's passage from 'heavy' to a contemporary 'light' stage under liquid condition has explanatory value for gig-work conditions discussed here. Instead of a lasting and more bounded employer-employee relationship and a disciplining surveillant setup, gig-work is based on flexible employment settings and self-surveillance. Both of these make it the workers' responsibility to perform and produce data to continuously demonstrate their productivity. Gig-economy, on the whole, seeks value in being asset-light and pursuing for itself, a dematerialised business model where production and physical labour is commoditised and individualised to the worker and the consumer.

The future of the workers within the platform ecosystem is then governed by pre-emptive profiling and prediction of risk using the identity and data they produce. This allows them mobility across the platform ecosystem but to help create commercial value where they can. In this , the workers undergo the scrutiny of 'categorical suspicion' performed by the banopticon at each instance of newly found digital participation within the platform ecosystem (Lyon 2018). Through the data they produce, individuals can demonstrate that they are not any more suspicious and can be included in

the digital economy. The gig-workers particularly have to straddle a hybridity of their role as a prosumer (Bardhi & Eckhardt 2017), where they work for the platforms in creating data and are being sold to by other platforms using the same data, such as becoming a customer for flow-based credit platforms.

Liquid inclusion is then Sisyphean, in that those seeking inclusion can fall foul of being a good prosumer and fall back to lower rungs of the platform ecosystem. For instance, an entwinement is seen in this paper between the production of data through gig-work , financial inclusion and social welfare. Workers facing unfair working conditions and so cannot produce enough income flow lose out on creditworthiness in the future as they become profiled by their data. This affects further workers' future verification as creditworthy or trustworthy people, affecting their employability again. This will affect the worker's eligibility for welfare under current rules, signalling a vicious cycle of data-driven marginality. Inclusion here can then be beneficial only under the right conditions of data production. But individuals can be easily adversely included as their data-profile's subjectivities can act against their cause to find beneficial participation.

Given that marginalised individuals face challenges in 'self-managing' their privacy and consent (Solove 2013), especially in systems built with an individual-centric assumption (Marwick & boyd 2018), the findings here signal the gaps in DEPA's stated aim as a route to the 'empowerment' of individuals in getting value out of their own data. Platform governance at large then needs to address the rights of the most marginal of these individuals and not just rely on broad mechanisms of consent and contracts. As Lyon (2014) contends and as depicted in the paper, the use of digital identity as a citizen under a construct such as DEPA involves the individual's involvement more as a 'data subject' – in handing over their data which flow through these complex synergies to create value to public and private sector entities. Especially as practices such as opaque data sharing agreements are far removed from individuals, 'liquid inclusion' needs to have an ethical view of the outcomes of the actual use of digital technology and not just in achieving an adoption of digital transformation

The liquefaction of inclusion is also a function of the increasing marketized approach that platforms espouse. Liquid modernity squarely captures this need for 'market-led solutions' (Doyle and Conboy 2020). As seen from the role of IndiaStack and its connections, there is a necessary marketisation of society with melding of the public and the private through entrepreneurial innovation that feeds into platforms generatively (Margetts & Nauman 2017). This ongoing liquefaction recasts the society as being flexible and transactional. There is a move away from the need to produce stable solid institutions, which were the original dominions of inclusion. For instance, the state emulates platforms under its banoptic surveillance, feeding this cycle of marketisation where even social

security is prosumer-ised. It is a qualified benefit and not a safety net to fall back on. The qualification is largely held within the power of platforms to dictate through profiling identity and data. The conventional markers of solid and public-sector led institutions – identity cards, documents, paper currency and traditional bank loans – are replaced with their transactional, fluctuating, digital and market-led versions, creating a complex ethical impact on the individuals. Marketisation also explains the break in the narrative about gig-work common in the global North, where it is primarily considered a force of informalisation of labour relations (Mezzadri 2020). But as shown in this thesis, gig-work in India is positioned as a highly datafied fragmented and marketized path to formalisation, with a complex involvement of digital platforms.

Empirically, the paper uses the case study of an under-researched construct - of the overlap between governmental digital identity practices and its connection to the digital economy. The findings demonstrate the ongoing melding of what is private and public in digital platforms, specifically within the global South where there is a void in legal protection and regulation of digital platforms. With technologies like India Stack, 'private market innovators' provide services within the platform ecosystem, all dependent on open data sharing (Sahamati n.d.). There is a need to look at tech-deterministic assumptions and surveillance of these players. This has a direct implication on how the governance of platforms is approached. The paper's detailing of complex impact and the growing influence of data-driven and algorithmic practices within platform ecosystems show the urgency for a strong ethical framework of platform governance.

7. Conclusion

The paper presents 'Liquid Inclusion' to map out the impact on marginalised individuals as they come under the effects of a platform ecosystem. It built an interpretivist case study using qualitative data on the experiences of cab-drivers and food-delivery workers on digital gig-work platforms in the city of Chennai in south India. The paper shows that these 'gig-workers' see their digital identity and data being used across multiple layers of platforms and constituent technologies. They encounter socio-technological rules of inclusion under datafication and surveillance performed by a multi-layered ecosystem that includes government-mandated digital identity, gig-work platforms and a constellation of commercial platforms delivering online services.

Using a lens of 'liquid surveillance', this paper shows that the route to inclusion under complex platform logics is enacted by the workers necessarily seeking mandated self-surveillance. The inclusion of the workers within the platform ecosystems is then hinged on a continuous performance of being qualified to belong, all gauged by the platforms using the generated data and online profiles. Liquid

inclusion as positioned here means that workers, under an emergent digital economy, need to contend with the fragmentation of traditional institutions of cash, identity card, paper documents and traditional bank loans, even as they are expected to be competent in their mutable digital equivalents. Inclusion, consequently, becomes liquid, as it is no more the result of an institutional safety net state but is constructed in temporally limited and transactional ways by the multiple dataflows that define the individuals' identity, trustworthiness, creditworthiness, and employability. Liquid inclusion is not about creating a stable social safety net. It is an ongoing process directed at producing effective producers and consumers of data, with which the individuals themselves need to hold on to their place in the digital economy.

A challenge in this paper is in contending with the breadth of the platform and its constituent technologies. It was a conscious choice to take an individual-centric view focused on gig-workers and plot the trajectory of their experience across multiple parts of the platform ecosystem. This has meant that while other stakeholders have a presence, there is no direct representation of their viewpoints. For instance, a valid alternative would be to include views for technology creators, platform managers, and customers of platforms themselves as users. Such an approach will provide a competing narrative of issues discussed here. A possible way to do this would be to look at the dynamics of a specific platform within the ecosystems in detail with data collected from an exhaustive list of various types of stakeholders.

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6. Critical Evaluation Chapter

This chapter provides an analysis of ideas discussed across the three papers presented in this thesis. This research aimed to explore inclusion within the digital platform context. In aid of this, the overarching research question was set as: "*How are inclusion and surveillance, and their paradoxical relationship performed through datafication in the digital platform ecosystem*?". Deriving from this question, a reading of literature was done to understand conceptualisations of datafication, surveillance and inclusion within information systems research and ICT4D disciplines. The research also sought to relate these concepts to cognate disciplines like critical data studies, organisation studies, human geography and surveillance studies. Informed by literature, two intertwined research lenses of 'abnormal justice' and 'liquid surveillance' were adopted to guide the research project.

The primary focus of this thesis, and across the three papers taken together, is exploring the under-researched area of inclusion within digital platform contexts. This chapter reviews the central constructs across the thesis and integrates them these under lenses of surveillance and social justice. This chapter presents two conceptualisations of inclusion - as a process and an outcome, as experienced under the advent of digital platform technologies. The process view of inclusion mainly demonstrates how datafication is imbricated with the performance of surveillance and inclusion. Further, inclusion as an outcome under the rubric of social justice is shaped by the nature of digital platforms and their ecosystem. The chapter continues by revisiting the research questions to frame the discussion that follows, on the interdisciplinary contributions made by this thesis.

The primary analytical concepts used in the thesis are presented here to signpost the rest of the chapter. The following table (6.1) as was presented in chapter 3 formed the theoretical basis for the thesis.

Surveillance – as 'Liquid Surveillance'	Inclusion – as 'Parity of Participation'
Banopticon keeping undesirable population out and allow inclusion for individuals.	The need for social identity as cultural **recognition** sought by individuals from state and non-state actors.
Synopticon that seduces the desirable individuals to part with data.	Betterment in access to financial resources such as income, wages and credit as economic **redistribution**.
Data-double as identity and profiles aggregated across the platform ecosystem	Voice and procedural fairness in practices of platform as political **representation**.

Table 6.1: Revisiting analytical categories used in research
- derived from Bauman & Lyon (2013) and Fraser (2008).

6.1. Inclusion as a process

In the reading of literature done, digital platforms are placed well within their ability to perform concomitant surveillance and datafication. As Van Djick (2014) presented, datafication is an act of bolstering the surveillance capabilities of both government agencies and commercial platforms. Specifically, business models of platforms in many commercial contexts depend on collecting and processing personal and transactional data. This thesis began with acknowledging that this making of 'data' was the vehicle of surveillance within contemporary digital platforms. This observation about digital platforms sits alongside the expectation of a positive developmental benefit under the newly emerging technologies. For instance, this is seen in the 'identity for development' discourse, which includes ideas on the role of Aadhaar like technologies in delivering inclusion for marginalised populations (Gelb & Metz 2018). Similarly, gig-work platforms are also implicated as a possible route to higher employment and as affording participation of marginalised populations within the digital economy (Heeks et al 2021). The thesis has shown that in such contexts, inclusion as a potential positive outcome has to be read as happening under the same processes of datafication as surveillance. So, the aim here is in understanding how inclusion itself as a process is navigated when it is enabled by data and its multiple flows within the digital platforms ecosystem.

The empirical data sheds light particularly on Aadhaar as a route to inclusion. The critique against data-driven surveillance (Van Djick 2014, Sadowski 2019) that tracking and aggregation of data often are made with 'unstated preset purposes', was mirrored in Aadhaar in its earlier years. As Aadhaar was ramping up, the actual purpose of the identity program was ill-defined, a concern that was regularly raised by civil society (Medianama 2016). Digital identity systems have also attracted similar critiques of data being collected 'without meaningful purpose' (Weitzberg et al 2021).

Despite these concerns, what in practice happened was a siphoning up of biometric and personal demographic data from millions of Indians who signed up for the Aadhaar program. The Indian state messaging on Aadhaar reflected this nebulousness of purpose where digital identity was projected as a route to participation within the digital economy in rhetorical terms (Khera 2019). The digital identity platform gathered various moving parts such as the India Stack and digital payments interface, and these connected Aadhaar to other digital platforms with private involvement strengthening the rhetoric. This led the way for surveillance and datafication being performed through interlocked governmental and commercial processes aimed at reliable data sharing across multiple systems.

In this, inclusion as a process is seen in three successive forms: enrolment, verification and data linkage. First is the enrolment process under Aadhaar. This process requires an individual Indian

resident to provide their biometric data – iris scans and fingerprints, which 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. The enrolment process was related to the need for identity, specifically to those who are undocumented and thus was a route to documentary and legal inclusion.

Secondly, the digital nature of Aadhaar was involved with data-driven inclusion through a 'verification' process. During this verification the personal and demographic data attached to Aadhaar document or the 12 digit number provided is validated against the UIDAI's database. In undertaking verification, the mere presence of Aadhaar is not deemed sufficient. Personal data of individuals is only considered authentic when using Aadhaar as a 'proof of identity' to verify their participation with a specific platform or service. This was mainly used in banking and digital payment services. Verification processes thus established the transition from showing one's own identity using paper documents to its datafied form. Thus, the Aadhaar enabled inclusion mandated proving an individual's identity and simultaneously worked to confirm the quality of their personal data to digital platform.

The third form was the data linkage process entailing the mandated linking of the Aadhaar number with specific governmental services and the ostensibly voluntary use of Aadhaar in commercial services. The underlying presence of Aadhaar then provides the ability to link different data elements across the platform ecosystem to the same individual. Technologies like India Stack work on this basis for commercial services - like digital credit services and worker onboarding platforms (IndiaStack n.d). For instance, the last layer of India Stack is the consent framework named DEPA (Data Empowerment and Protection Architecture). Based on informed consent, DEPA enables data-sharing across services and other platforms which connect to India Stack as 'open personal data store' (IndiaStack n.d.). This envisions a future where a marketplace approach brings together 'data-providers' and 'data-consumers' based on free data-sharing across multiple sectors. This is expected to provide a route to gauging the credit worthiness of those who do not have a previous financial history. This marketplace approach enables algorithmic and speculative use of the data generated of and by the gig-workers within multiple platforms.

Thus, generative changes within Indian platform ecosystem are built on surveillant dataflow between the constituent parts of the ecosystem and become defined pathways to inclusion for those who have fallen outside the ecosystem until now. Enrolment and verification work on mandated biometric and data-driven surveillance practices, creating respectively a digital identity and validated dataset for those seeking inclusion. As the surveilled individual's data gains entry into a platform ecosystem, multiple data-driven linkages across platform contexts create an individual's distributed

data profile. This is seen in gig-work where income, employment and personal data are intricately connected to Aadhaar at multiple stages. This continuous and incremental growth of data-based profiles of individuals, which is spread across the platform ecosystem, but built on a bedrock of Aadhaar becomes the primary vehicle for inclusion.

6.1.1. Multiple Layers of Inclusion

The three processes of enrolment, verification and data linkages signal corresponding processes of surveillance. These can be plotted across a 'trajectory' of inclusion, with multiple surveillant stages and contexts being observed that govern an individual's journey from being outside the digital platform context to becoming included as shown in the figure below (6.1).
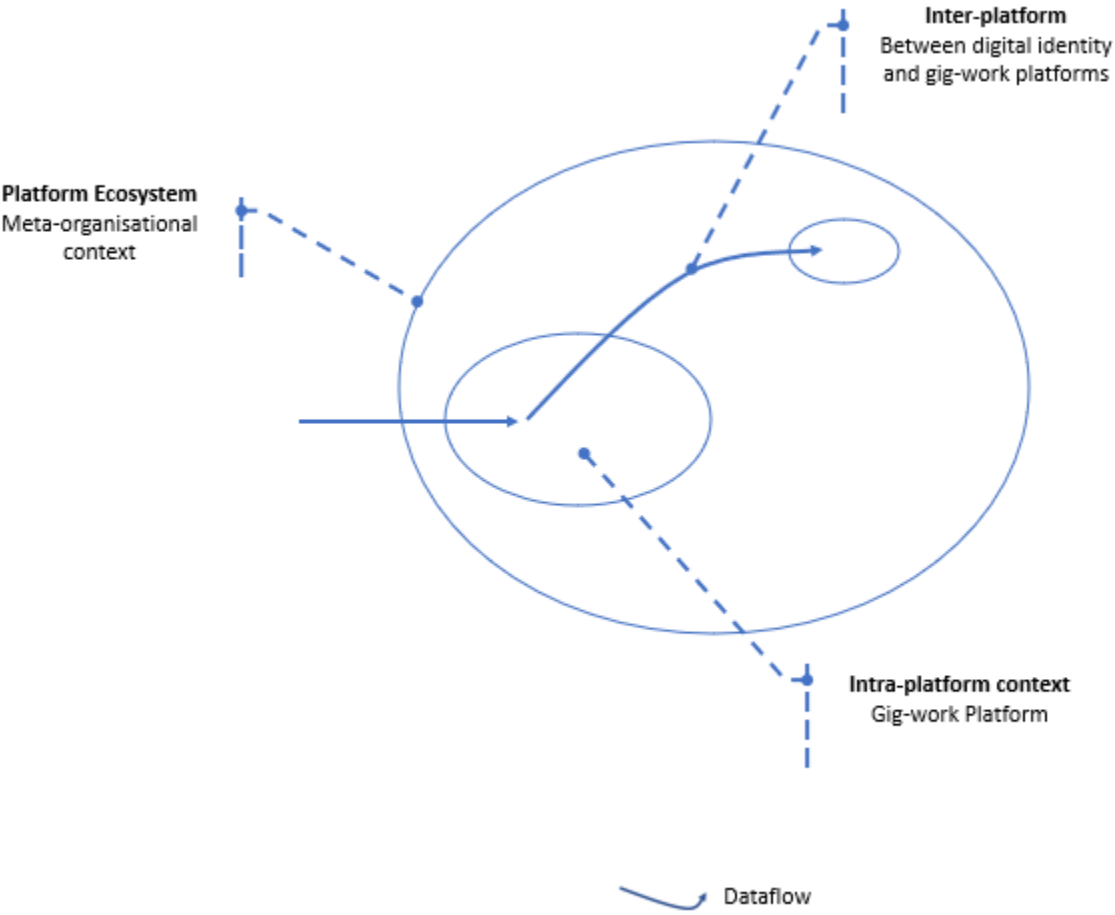
Figure 6.1: Meta, Inter and Intra platform contexts of surveillance and inclusion

First of this is the biometric digital identity of Aadhaar. The actual process of inclusion under Aadhaar is explained by the post-panoptic construct of the 'banopticon' and its notional border (Bauman & Lyon 2013, Bigo 2014). Aadhaar's banoptic function defines the border between included and excluded groups and enables datafication of users who were previously not digitally represented. Here, crossing

the banoptic border entails a prerequisite to submit one's data as a form of biometric datafication (Ajana 2020). Datafication becomes a central prerequisite for participation in the digital platform ecosystem as Aadhaar is tied into many essential services within the society such as banking, income tax and welfare.

So, Aadhaar enacts a form of inclusion that is largely nominal. Anyone with Aadhaar can effectively tick the first box of eligibility to participate digitally. This can be considered inclusion into the platform ecosystem as a meta-organisational context. That is, with Aadhaar, individuals are no longer just analogue beings and now gain entry into the digitally mediated ecosystem as a whole with their verified data available to multiple platforms. Aadhaar as seen, is not just a standalone governmental system. The individual enrolled under Aadhaar has taken a first step in having a digital presence. Their data is newly represented in one part of the platform ecosystem – maintained by the government in the form of the Aadhaar's UIDAI database and allied infrastructure. But this data is almost immediately available to other platforms which connect to or consume Aadhaar as a proof of identity or UIDAI as the verifier of data.

In seeking inclusion under Aadhaar, Indian residents are coaxed or coerced into submitting to biometric surveillance. Drawn either by multiple depictions of the digital identity's benefits showcased by the government or the many messages of the pseudo-mandatory need for Aadhaar marketed in commercial settings (Khera 2019), a voluntary self-surveillance is seen to be enabled by digital identity as the banopticon. While the voluntariness of Aadhaar is varied, what is definitive is that the banopticon acts as a 'do-it-yourself' apparatus with which the individual can seek participation into the networks of the digital platform ecosystem. Self-surveillance here is needed by those excluded to demonstrate their visibility to the state using Aadhaar. But as the surveillance context moves to different platforms, individuals showcase this newfound visibility to other entities like gig-work platforms, credit or loan providers and even potential private individuals like customers of platforms.

Surveillance, or more precisely, self-surveillance is then made a necessity using Aadhaar as a digital identity platform and performed through the verification processes. At this point, an 'inter-platform' perspective is seen where the conceptualisation of dataflow between platform contexts connects surveillance and inclusion. The first of the three papers in this thesis (Krishna 2021) demonstrates that gig-work technologies pick up the process of surveillance and datafication where Aadhaar's enrolment and verification end. Dataflows among Aadhaar, gig-work platforms, and other platforms perform interrelated governmental and commercial processes for the supposed ends of financial inclusion and formalisation. But as seen, these can also create opposite effects. These dataflows do not have to be automatic . It is sufficient for the individual to perform self-surveillance

by providing Aadhaar as a proof of identity for their data to be replicated elsewhere. Thus creating an Aadhaar linked path to data sharing.

The underlying datafication infrastructure here acts as what can be termed a 'banoptic platform' defining inclusion across the ecosystem. The thesis shows that a datafication of the banopticon emerges under platform logics. The rules of inclusion within the banoptic platform is constructed by tools of datafication: data, algorithms and profiling. The banopticon platform aims to allow inclusion by generating data where it did not exist before. This applies to the millions of Indian undocumented and under-digitised individuals who were the target for the digital identity platform. These multitudes now generate data in multiple ways while being on the 'included' side of the banoptic border.

The banopticon uses the dataflows across the platform ecosystem to qualify if the individual's profile is fit to be included beyond its gatekeeping function. Across the digital platform ecosystem the rules that define the banoptic border become complex. The individual faces multiple such banoptic interactions from biometric enrolment to algorithmic profiling. Inclusion is defined as legal documentation at the point of Aadhaar enrolment. Then inclusion becomes the providing of validated data at the point of verification. As data flows further through the platform ecosystem, inclusion is determined by a profile of the surveilled individual formed by technologies that pick up their data traces. This trajectory of inclusion can be seen by taking the example of a vignette showing the pathway to availability of credit as experienced by gig-workers (see figure 6.2). In this vignette Aadhaar proves an undocumented person's identity and can help open a bank account. Their verification with the bank also provides demographic data that can flow through to digital payment platforms. At this point, data is also verified by gig-work platforms using digital trust platforms as part of the contractual relationship. Dataflows finds pathways from these various platforms onto the digital credit provision platform to create alternative credit scoring.
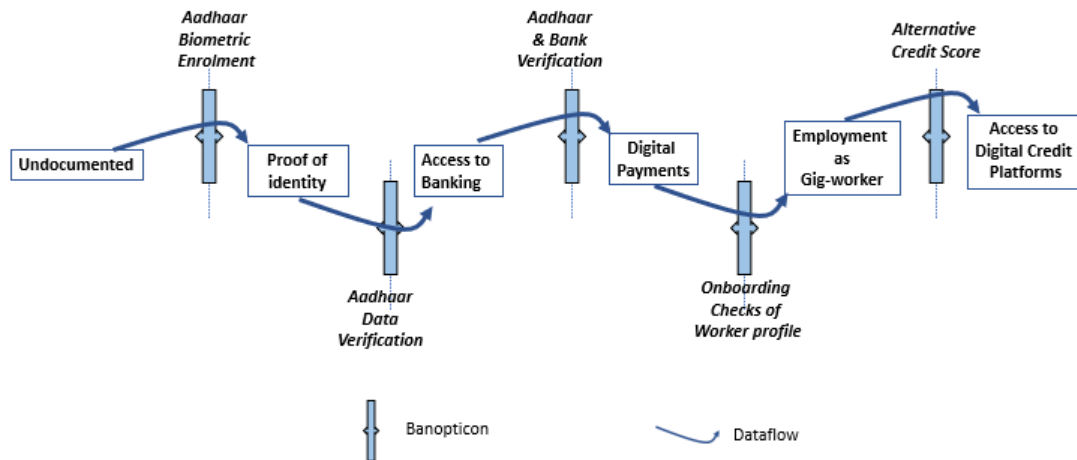
Figure 6.2: Inclusion pathway to credit for ride-hailing and food-delivery gig-workers

As seen from this vignette, at each stage, the profile of the gig-worker gathers newer data attributes, creating a complex representative profile of the individual. This profile or the 'data double' (Bauman & Lyon 2013) becomes the subject of inclusion rather than the person. The data-double allows for algorithmic and speculative use of the data on gig-workers in commercial contexts like credit platforms. Though the internal machinations of these services are currently opaque, companies like Avail Finance or Bon Credit have stated the specific ways in which they enable access for gig-workers using algorithmic credit scoring (Avail Finance n.d., India FinTech Forum 2020, The Hindu 2020a, CNBCTV18 2021,)

Data aggregation is also intimately related to the workers' participation within platforms for livelihood. Compared to gig-workers who perform a data generative livelihood within digital platform apps, those who interact only with Aadhaar and not with gig-work find a different experience. For instance, looking at the equivalent trajectory for domestic workers (in figure 6.3) as discussed in the first paper in this thesis (Krishna 2021), it can be seen that Aadhaar becomes the proof of identity for banks and for the 'blue-collar' job portals on which women seek employment opportunities. Their work remains largely informal with no participation in digital payments and remains outside the realm of digital platform apps other than to seek work. So, datafication at the level of Aadhaar remains a verification of their personal identity. Dataflows diverge from Aadhaar use by domestic workers to theirs banks and the job portal, where they remain siloed as independent data-profiles. But they can merge within the platform ecosystem if a newer service or platform seeks to use these siloed data. Using Aadhaar as a proof of identity will allow the merging of these data silos. Then, inclusion is not

the result of a single stream of data flowing between two points but performed by dataflows and data-profiles that diverge and merge across multiple socio-technological layers and contexts.
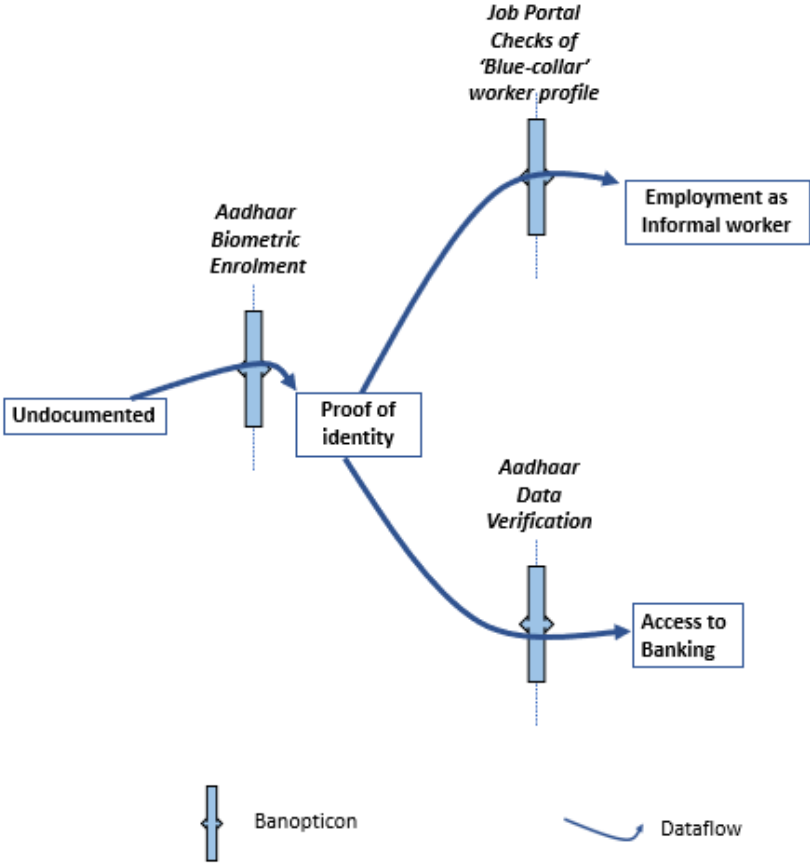
Figure 6.3: Inclusion pathways to banking and employment for Informal domestic workers

The use of liquidity as a metaphor for surveillance helps paint a clearer picture of inclusion. Inclusion performed through dataflows is not a linear trajectory from exclusion to holistic inclusion. The trajectory of inclusion, and its relation specifically to datafication within the platform ecosystem, can be understood by staying with the liquid metaphor where inclusion can be imagined more effectively. Banoptic inclusion acts as a set of gates (as in a dam) that open and close to allow the flow of data, rather than a canal structure that can direct the flow entirely from one point to another. A canal is designed with the ideals of where and how to direct the water. But the multiple banoptic borders act primarily as a series of gates at multiple stages within the platform ecosystem, allowing the selective flow of data and thereby inclusion beyond them. Datafied inclusion under such a conceptualisation is then of a layered nature within the platform ecosystem, with the multiple levels and stakeholders influencing to determine what inclusion means within their domain.

While trajectories discussed in this section are typified examples of inclusion and can vary for each worker, this view of the platform ecosystem demonstrates how personal data and surveillance of the same define inclusion at multiple stages where the individuals seek to participate in a newer digitally mediated context. This view is further complicated by the presence of platforms that accumulate data, such as digital trust platforms referred to in papers 1 and 3 (Krishna 2021, Krishna n.d.) of this thesis.

Following the dataflows allows the exploration of the multiple contexts of inclusion within the platform ecosystems. An 'intra-platform' perspective can be understood where datafication plays out within a specific platform setting. In this thesis, the second paper (Krishna 2020) provides the social justice impact of datafication and surveillance conceptualised by the idea of 'spatiotemporal justice'. Though spatiotemporality is a gig-work specific construct, the highlighted inequities show how the datafication context impedes inclusion of the worker within the narrower context of a specific digital platform. This perspective can be applied to other platforms such as credit or trust platforms. By doing so, questions can be raised on the fairness of platform design choices which bear relevance to how datafication is enacted.

For instance, as seen in the paper (Krishna 2020), the workers' income potential and working conditions are directly implicated by how their time and spatial movements are controlled, surveilled, and datafied by the platforms. These platform decisions on measuring space and time affect the workers profoundly as employed 'users' within the food delivery platforms. Such design choices of datafication, which in gig-work platform is done through the measurement of spatial and temporal aspects, are only within the specific platform's boundaries and contribute to its business model. But as shown in the third paper (Krishna n.d.), dataflows generated by these design choices affect the workers' position in the larger platform ecosystem involving financial inclusion and other non-economic conditions faced by the workers. Specifically, the income flows calculated by platforms like Swiggy and Ola are directly used by credit platforms (ET 2019) and are fed into the social welfare calculations made under the Indian government's new labour and social security code (MoJL 2020).

'Liquid inclusion' as conceptualised renders liquefaction of identity, now cast as datafied profiles. The three processual forms also shed further light on the ramifications of this datafication. The trajectory from enrolment, through verification to linkages shows a steady increase in the amount of digitisation and dematerialisation of contexts. Biometric enrolment and the necessity to get a documentary proof of Aadhaar mirrors traditional pre-digital identity card processes. Verification too involves a modicum of paper documentation, especially for the marginalised population as processes like 'know-your-customer' check are hybrid. But outcome at the point of verification is that the

individual's data-double is a confirmed participant in the platform ecosystem. If the individual fails to perform the right actions such as of self-surveillance, the generation of appropriate data or to meet the qualifying criteria at each banoptic border, they can fall foul of the condition for inclusion. This may even affect or disqualify them from other parts of the platform ecosystem, like how Aadhaar and gig-work data are necessary to qualify workers for governmental welfare programs and depend on the underlying dataflows. Ultimately inclusion remains a way to participate in the platform ecosystem with an ongoing performance of what Bauman & Lyon (2013) call self-surveillance to showcase their eligibility to be included.

Thus, analysing the newfound participation among marginalised users of the digital platform ecosystem show that they face processual surveillance and its attendant inclusion at various levels. This is experienced as mandated and voluntary self-surveillance in the form of enrolment, verification and other surveillant linkages that generate data and allow the marginalised to be placed on a pathway to inclusion that can involve a longer trajectory within the digital platform ecosystem.

6.1.2. Temporal Trajectory of Inclusion

The last section presented the trajectory of surveillant inclusion as discussed across the three papers in the thesis. An overarching theme of ' temporality ' emerges by reading further into literature and looking at the empirical data beyond what is already presented in the three papers. Temporality connects surveillance and inclusion and bridges further the ideas discussed across the three papers.

Inclusion here is directly a result of surveillance temporalised in two ways under liquidity. The first is through how the banopticon operationalises surveillance. The panopticon metaphor was shown to exert power spatially – by incarceration, and its effect of visibility was under a bounded condition of restricting who is undesirable and then being closely watched. Liquid surveillance, the banopticon and their post-panoptical idea of visibility invert the boundedness of panopticon. Banopticon places a premium on affording mobility rather than incarceration. Those considered desirable enough cross the banoptic notional border and are offered a freedom of mobility to be included to whatever is beyond the banopticon.

In this context, Bigo (2008) presents that this affordance of mobility itself is a 'temporal' marker of surveillance as opposed to the spatially limited visibility of the panoptic era. While the power of the panopticon was spatial in watching those in metaphorical cells and knowing their ongoing behaviour, banoptic power is in predicting if those crossing its border will be compliant with the rules of being included. Power is in predicting the future risk attributed to the individual and by knowledge of their historical compliance. Data-driven surveillance affords this knowledge of the past and the ability of prediction, all to undertake pre-emptive security. This is considered an aspect of 'post-9/11'

temporalisation of surveillance (Bigo 2008). Ultimately inclusion under such a liquid surveillant setup is itself a temporal power (Doyle and Conboy 2020).

For instance, as seen in the second paper of this thesis (Krishna 2020) multiple micro-level temporal subjectivities of the workers surveilled and captured as data are aggregated towards determining the economic future for the workers. This data directly impacts the workers' access to loans under market-based credit platforms that algorithmically predict their future risk potential in the form of credit scoring. Temporalities of gig-work are also related to predictions with the platforms business model, as shown. Prediction is in fact crucial for the gig-work platforms to deliver their 'on-demand' business and achieve 'just-in-time' efficiency (De Stefano 2015). In this vein, Flyverbom & Garsten (2021) present an 'anticipatory governance' where datafication provides a 'temporal orientation' to predict and make decisions about the future within organisational setting. Prediction as a result of datafication, as seen in this thesis, also links temporality and inclusion across the meta-organisational platform ecosystem afforded by dataflows.

The second link of temporality and inclusion is related to the fragmentation and episodic nature of self-identity within the liquid modern condition. Bauman's (2000) discusses a temporal notion in defining one's own self-identity and identity itself as being liquefied. Bauman claims that the identity is not 'given' but is the responsibility of the individual to perform episodic 'tasks' of self-identification. Under liquid surveillance (Lyon 2010, Bauman & Lyon 2013), this identification is enacted through banoptic surveillance. Liquidity means there is a continual need for individuals to construct their self-identity (Doyle & Conboy 2020).

In such a context, surveillant power can be framed under the ongoing need for self-surveillance. Lyon (2010) presents that dataflows within liquidity make surveillance 'time sensitive'. The banopticon in this performs the continual and, in many cases, time-limited need to perform one's own self-identity (Nagy 2016). Surveillant power has become temporal; that is, power is in establishing a temporal profile of individuals. Without the individual seeking surveillance of their past histories, current behaviours, and a prediction of future risk of non-compliance, inclusion cannot be achieved. It becomes an episodic duty of the surveilled individual to keep visibility and attention over themselves intact and still deal with the outcomes of surveillance, both positive and negative. This can be seen in the empirical context described in this thesis, where it is clear that at each stage temporally fragmented data about the gig-worker incrementally create a longer-term profile that determines the worker's future within the platform ecosystem. While a traditional documentary proof defines a set version of individual identity, after biometric datafication under Aadhaar, identity is temporally

delimited and mandated by episodic verification. Identity then is no longer solid and long-term, it is liquid and ephemeral.

Ultimately, liquid inclusion is then 'Sisyphean', both temporally and in defining an end goal. Sisyphus, in Greek mythology, is punished by having to roll a boulder uphill, only for it to roll back down as he nears the top. Liquid inclusion mirrors this as a continuous short-term performance towards a long-term idea of a seemingly achievable end-state of 'inclusion'. But any number of intervening and newly emerging states of surveillance can redefine the path to an indeterminate inclusion, making inclusion itself a moving goal-post. This is seen where Aadhaar's enrolment predicates the datafication of the body, then verification necessitates an ostensible quality check of the same data. Verified data then flows into an indeterminate series of platforms where commercial extractive logics dictate that the individual produces the right kind of data and that data is exploitable for value. Data ill produced or of low monetary value, and even if the quality of data doesn't match the need of platforms determining these conditions, the individual is pushed down the metaphorical Sisyphean hill by the banoptic apparatus. This process can repeat itself *ad infinitum* as newer platforms take up the mantle of datafication and surveillance.

This conceptualisation of what is termed 'liquid inclusion' in the third paper of this thesis (Krishna n.d.), and the temporal construct demonstrated in this section, shows that participation within platforms and uses of its constituent technologies are not the end goals for inclusion. In fact, inclusion remains an ongoing process without a possibility to define its end goal. The challenge then for research on inclusion is to understand the impact of surveillance that is directed towards or espoused by individuals themselves and within the purported inclusive agendas. This can be analysed using the lens of social justice, which is detailed in the next section.

6.2. Inclusion as an outcome

The perspectives presented in this thesis show evidence of how inclusion of marginalised population is entwined with surveillance within digital platform ecosystems. In this context, the use of a social justice lens helps explore inclusion as an intended outcome of digital platforms but also to understand the wider discriminatory impact that this participation causes.

The construct of social justice as seen in two of the papers (Krishna 2020 & 2021) in this thesis helps critically approach participation within the digital platform context and understand the actual outcomes experienced by marginalised individuals. Existing research on beneficial participation within digital context already move beyond mere provision (or access) to look at the outcomes as social impact attributed to technology (Zheng & Walsham 2021). While many of these observations were

made of digital technology in general, this thesis centres the logics of digital platform and its influence on what can be defined as 'inclusion'. For instance, the empirical evidence discussed in this thesis shows that inclusion is a prominently stated aim of Aadhaar, and is also presented as an opportunity under the wider platform ecosystem. Here claims are made that a digitally led path exists that undocumented, unbanked individuals or unorganised workers can take to participate in India's growing digital economy. The answer to exclusion due to undocumented, unbanked and unorganised livelihood seen in the Indian situation, then, is not of merely becoming documented, banked and formalised. As seen in the thesis, inclusion has transformed to means a negotiation of the datafied versions of paperless, cashless, and gig-work based participation. This profoundly changes the way participation works as the marginalised users enter the digital economy. A question emerges on the holistic impact of these datafied alternatives to identity documents, banking and formal employment in performing inclusion.

At this point the use of 'abnormal justice' as a conceptual framework to theorise inclusion has been very pertinent. As Fraser (2008, 2009) presents social justice is the achievement of a 'parity of participation' across intersectional domains of economic distribution, cultural recognition and political representation. True parity is achieved in the abnormal justice view only by overcoming extant subordination across the economic, cultural and political domains, and thereby interacting as equals with other actors in the society. Inclusion thus envisaged is a consummate construct where the outcome is not just gaining access into platform context or seeing benefits of one kind. Rather, inclusion is to be truly 'just' by overcoming extant subordination across the three intersectional economic, cultural and political dimensions.

This view of inclusion sits well with the existing aim to theorise social inclusion as an intersectional impact on the individual. For instance, Zheng & Walsham (2021) argue that understanding intersectional contexts of digital technologies allows research to 'situate individual experience within networks of power relations'. The application of abnormal justice, as done in the first paper of this thesis (Krishna 2021), shows the potential to understand better the impact of participation in digital platforms by taking into account the subordinated position of the individual within the platform mediated society. Inclusion here is participation enabled using an access to digital platform and includes a promised pathway to economic betterment as one aspect. It is more likely that the marginalised population seeking this pathway have historically faced subordination due to cultural markers such as caste, religion or gender alongside their lowered financial status (Gangadharan 2017). So an idea of inclusion emerges which needs to be seen as social justice oriented or a 'just inclusion' that overcomes an intersectional subordination. The rubric presented by abnormal justice (Fraser

2008) and as discussed earlier can be employed to query the complexities of the surveillant process of inclusion under digital platforms.

6.2.1. Intersectional Performance of Inclusion

Adopting the intersectional rubric for a 'just' inclusion across economic, cultural and political dimensions is useful to explore the multiple contexts of surveillant inclusion. When inclusion is described as an outcome of digital platform practices, it is usually a positive economic framing as access to financial resources. But there is a pressing need to balance this narrative with the wider impact that surveillance causes (Lagna & Ravishankar 2021) by taking into account non-economic domains. This need is addressed by accounting for the impact of datafication in the cultural and political domains. The trajectory from outside the digital platform context to being included within then can be seen as an intersectional performance of the surveilled individuals negotiating subordination before and after being datafied. Two specific examples discussed in this thesis can be used to demonstrate this. As the first two papers on this thesis (Krishna 2020 & 2021) show, both the use of Aadhaar and spatiotemporal data in gig-work are mainly geared towards access to better financial options. But they are built by co-opting market logics of platforms that preclude cultural or political parity.

In the first example of Aadhaar led datafication presented in this thesis (Krishna 2021), there is a clear presumption of a lack of trust, in allowing participation of workers who are newly emerging into the digital economy. The workers own need for Aadhaar was anchored on financial access to banks and loans, and also as a legal validation in the form of Aadhaar as a documentary proof. Using abnormal justice as evaluative framework, it can be seen that the workers seek economic participation as much as a political acknowledgement in the form of a legal identity. But these objectives as seen in the paper (Krishna 2021) are moored in cultural barriers to equal participation that the marginalised groups face in having to establish trustworthiness within a digital economy. Aadhaar's platform logics establish the idea of digital identity to showcase one's own trustworthiness to the wider set of stakeholders within the platform context. This as a 'categorical suspicion' of workers in the Indian context, is also used to justify permeating datafication and surveillance (Lyon 2010).

So, for the surveilled and already marginalised individual, even if their aim is a financially beneficial participation into the digital economy, the performance of inclusion afforded to them is to seek a valid recognition of their identity and role in society. But the extant subordination of marginalised populations means that the platform choices prioritise dominant groups' view of society. Surveillance here is in enacting this recognition – by the provision of banoptic visibility of the individual

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to those who decide on if the surveilled individual is qualified to belong, mainly based on the dominant view of the customers occupying the upper/middle socio-economic classes. This is reflected in the absence of legitimacy seen among domestic-workers while using Aadhaar. Digital identity only becomes a tool to assuage the security anxieties of customers in allowing workers deemed categorically suspicious to participate within digital platforms but doesn't guarantee any legitimacy for the workers themselves in their mostly informal work conditions (Krishna 2021). As Bauman & Lyon (2013) mention, without engaging in such surveillance, these surveilled individuals will be 'denied the capacity' to be included, even if nominally so.

Similarly, the market logics of gig-work platforms have a cultural background pegged on the power differential between customers and workers within digitally mediated transactions. There is a clear asymmetry in the use of spatial and temporal data between workers and customers of gig-work as demonstrated in the second paper (Krishna 2020). But these cultural meanings of space and time are shorn off in platform practices reducing the transaction to be mainly an economic metric. Issues that are primary for the workers are of wages and access to credit, all of which are seeking economic benefit in some form. But the platforms control this domain by defining the pathways to economic outcomes for the worker where cultural contexts are rarely contextualised, and even exploit existing cultural domination of workers to exact unfair working conditions and unpaid labour.

Ultimately, a truly 'just inclusion' occurs only when any subordination in the form of misrecognition, maldistribution or misrepresentation are actively rooted out to deliver a holistic parity of participation across all domains (Fraser 2008). In practice when a major focus is on a narrowly defined economic inclusion of marginalised communities, but not on equal terms, the existing intersectional subordination is not addressed. For instance, wider research shows that socio-cultural context of datafication are rarely given deeper exploration (Flensburg & Lomborg 2021). This then brackets how the impact of surveillance and datafication propagates across the platform ecosystem. There is a real risk that the 'markers' of subordination become datafied and continue as discriminatory impact along the trajectory of the workers' inclusion and into other parts of the platform ecosystem. This is seen in the second paper in this thesis (Krishna 2020), where a codification of working-class servility and inequality within digital procedural aspects results from a platform controlled spatiotemporal economic calculus.

At this point, the third domain of 'just' inclusion as an aspect of political/procedural justice is seen to be relevant. In digital platform context the parity in representation is seen to be mainly a means to temper the impacts of datafication. As both surveillance and inclusion use data as its vehicle in the platform ecosystem, procedural issues of how data is handled, protected and controlled are all

pertinent (Heeks & Shekhar 2019). This is an important aspect left out wherever there is an over optimistic attribution of positive benefit to how data helps those who did not have access before to digital economy. As shown in the papers detailing worker experiences of Aadhaar and gig-work practices, a data-driven inclusion can occur without an individual retaining control of their own data. Issues such as ill-informed consent practices or problems in how spatiotemporal labour is represented in data all play out across multiple points in the platform ecosystem. Most of these issues are rooted in the absence of data protection and data rights (Arora 2016).

The political aspect of inclusion is also then to be considered as the voice of the individual being present in determining their own future. In studying the use of communicative and social media platforms, the generation of overt online content and social interactions attract a tag of political participation and as providing voice in democratic decision making (Fuchs 2014, Banaji & Moreno-Almeida 2020). But perhaps because datafication in digital platforms is a more covert performance of participation, data-driven 'inclusion' continues to be broadly painted using an information systems perspective as some form of access in crossing the 'digital divide' (Young et al. 2021). An intersectional conceptualisation that acknowledges the need for and the absence of political voice of the marginalised, especially on decisions taken about and using their own data is a prerequisite in defining inclusion. As Fraser (2007) puts it there is 'no redistribution or recognition without representation'. Then, 'just' inclusion in light of the excesses of datafication, is in reining in the power of data and forms the bedrock on which inclusion can be delivered. An intersectional, just and holistic inclusion is consequently dependent on individuals wresting back control of their own data from the complete control of platforms. Without procedural and political inclusion of surveilled individuals which provide a voice and the control of their own data, true inclusion cannot occur.

In this context where the control of data is lost, the datafication of inclusion doesn't only determine the current outcome of participation for marginalised users, it extends to their future within the platform ecosystems governed by profiling and prediction of their data. That is, just as inclusion is shown to be performed by datafication, equally continued datafication becomes the outcome of seeking inclusion. In short, datafication cannot be stopped at a defined point where inclusion is said to have been achieved. Wherever the data flows, the context of inclusion and the connected issue of surveillance just shifts along with the data. The next section discusses the impact of this continuing datafication using the metaphor of liquidity as discussed in the earlier chapters of this thesis.

6.2.2. Fragmentation of Inclusion

The concept of 'liquid inclusion' as presented in this thesis, can contend with the transition of those outside digital contexts encountering datafication as a necessary performance to become part of a

digitally mediated society. The primary framing of surveillance is that datafication makes possible 'post-panoptic' visibilities. Unlike the top-down, monolithic 'Big Brother' view of surveillance, liquid surveillance is performed over interconnected networks with dataflows enabling surveilled individuals' visibility to multiple watchers (Lyon 2010). True to its established post panoptic nature, there is a fragmentation of both surveillance as a banoptic process and its social outcome of recognition. Where a powerful state was the purveyor of surveillance and enabling recognition of its citizens, datafication fragments the role of a watcher to whoever has access to the dataflows and gains knowledge about the individual who parted with their data. Consequently, inclusion too needs to account for the performance of participation done in multiple ways, especially of seeking banoptic recognition from multiple watchers. It follows that inclusion itself is fragmented, unbounded and within a complex nexus of government and private commercial platforms.

Fragmentation acts at a more granular level too, where datafication breaks up the individual and their contexts into multiple fragments of data. This fragmentation becomes a necessity for 'better lives' of those surveilled, even if a vast majority of this data ends up being used for the benefit of the platforms (Lyon, 2017). The banopticon enacts, in case of Aadhaar, a 'biometric datafication' (Ajana 2020). There is, further, an increasing fragmentation seen in the multiple banoptic encounters across the trajectory of inclusion. Across surveillant processes of Aadhaar enrolment, its verification and the resulting data linkages, inclusion is more data-driven and less involved directly with the individual.

The site of inclusion is not the embodied individual but the datafied 'dividual' or the 'data-double' (Iveson & Maalsen 2019). The 'dividual' here refers to the divided/divisible representation of an entity hitherto considered indivisible. Or put another way, the indivisible human context now becomes a divisible representation spread in an amorphous collection of data across the platform ecosystem. Much as inclusion is enacted by surveillant datafication, fragmentation follows at the heels of inclusion. Extraction of value from this fragmented data-double forms the foremost of any platform capitalist logics. The included data-double then can then be recombined in multiple ways across the platform ecosystem to gain commercial insight and even perform prediction (Galič et al. 2017).

So in effect, inclusion is fragmented across the platform ecosystem. Much like surveillance, inclusion needs to be understood not as a monolithic idea but as being performed across multiple datafied interactions where the data-double is at the centre. In this view, inclusion is not to be considered as over-optimistic or a tech-deterministic promise of betterment but is the performance of being datafied where the individual was not before represented digitally. As discussed in the previous section, the true benefit of inclusion to those marginalised then is based on if such a performance of datafication results in positive and holistic outcomes. In the absence of such an

outcome, what emerges is a picture of the marginalised class of users subordinated to another stakeholder (like the government or a commercial platform) despite datafication.

Unlike scholars who foreground exclusion as the failure of inclusion (Masiero & Arvidsson 2021), this thesis doesn't consider inclusion by itself a positive construct. In this, it mirrors the 'adverse digital incorporation' presented by (Heeks 2021). This thesis would go as far as to argue that inclusion at its most basic form of getting 'access' into a digital ecosystem is not a difficult proposition in a datafied society. But achieving an intersectionally 'just' inclusion as discussed is the issue of contention that marginalised individuals face. This is evidenced by the huge success of Aadhaar's enrolment. All of those who were marginalised and now biometrically datafied are still included with their data-double residing in UIDAI's databases, only to be recalled when the government or private players who consume Aadhaar data have use for them. In this case, the absolute exclusion is much rarer. The datafied information as data-double still occupies its rightful place in multiple databases. But there is a failure to achieve just inclusion because the fragmented data double is never put to use for the benefit of the individual. So even if inclusion as a data-double happens, a more significant failure of 'just' inclusion can routinely occur.

Further fragmentation occurs when the individual, an informal worker, becomes a user of other platform services. In the case of gig-workers, they adopt digital payments, take up work on gig-work platforms, and seek loans from credit platforms. The data-double is enhanced but fragmented across these individual contexts, waiting for those who can reconstruct and seek value from these disparate datasets. This can also be read in the first paper (Krishna 2021) where this thesis explored the notion of extending 'data-class' (Manovich 2012, Andrejevic 2014), that those who can analyse, draw insight and extract value from data benefit most. At every point the individual crosses a banoptic border that otherwise would have kept 'undesirables' at bay, they become desirable to these data extractive entities as purely valuable data-doubles.

The context of data-double can be also understood from what Lyon (2010) terms 'categorical seduction'. On the included side of the banopticon, individuals are already deemed desirable. But the desire works both ways. In their trajectory across the platform ecosystem, the individuals show a desire to participate further in the data-driven market economy. The domain of surveillance crosses over from that of the banopticon into that of synoptic measures. Individuals face consumer marketing tactics that coax, nudge, and persuade them to share more and more data (Cheney-Lippold 2011). At this point, a consumerist seduction (Bauman & Lyon 2013) is at play, multiplying their consumption needs making these individuals more valuable as data-doubles. This thesis demonstrated the seduction in the platform ecosystem through first, the successive marketing strategies undertaken by the Indian

government in presenting Aadhaar as a totalising tool of financial benefit, and second, the promise of income and credit that gig-work platforms offer to attract workers. Thus, within the platform ecosystem, data-driven consumption practices act as a seductive pull rather than a coercive push to part with data, specifically for people who are fast emerging from the 'bottom of the pyramid' as new digital consumers (Arora 2016).

The fragmentation of inclusion plays out further when surveilled marginalised individuals take up hybrid interactional roles within the platform ecosystem. The beginning of inclusion, as this thesis showed, is biometric datafication of a citizen or resident of India when they enrol into Aadhar . Datafication then casts individuals with multiple roles. First, as Aadhaar enrolled residents, then as transactional gig-workers, then further along as consumers of digital payments or credit platforms. At each stage, the individuals become producers of valuable data that are economic assets for the platforms, and they are continued to be sought after as consumers. A good 'prosumer' who effectively produces data and consumes at the right pace (Bardhi & Eckhardt 2017) can stand a better chance of staying included within the platform ecosystem. Continued participation in the economy depends on how malleable an individual is in flitting between these multiple roles. Liquid inclusion here again can be considered Sisyphean, in that those seeking inclusion can fall foul of being a good prosumer and fall back to lower trenches of the platform ecosystem. In turn, inclusion itself is dependent on the liquidity that the individual's data affords them in negotiating these fragmented roles and performing as desirable prosumers to maintain their trajectory of inclusion.

Fragmentation, as Bauman & Lyon (2013) consider, is also a function of the liquefaction of social interactions and the institutions within which inclusion is sought to be achieved. The fragmenting effects of platform ecosystems also affect institutions which were traditionally deeply involved with marginalised populations and their claim to participate in wider society. As seen from the papers in this thesis, there is a replacement of cash, paper-based identity and traditional employer-employee contractual relationship with their digital equivalents. What was once a step towards inclusion is actually interpreted by digital platforms under the newly datafied constructs as mainly an act of combined data production and consumption. For instance, participation in formal banking does not involve access to credit for a marginalised worker. It is the aggregation of data on digital gig-work transactions and payments that can be used by platforms to gauge a credit score. In this way the fragmentation of the livelihood contexts of those who seek inclusion assists platforms in filling up gaps where formal institutions do not operate (Heeks et al 2021). The absence of formal credit access or employment benefits is replaced as seen in the thesis with a datafied and transactional version of the same. The thesis particularly shows evidence from a global South context where voids in data-

protection and gaps in labour welfare are exploited within the newly datafied gig-work platform ecosystem.

6.3. Social Justice View of Surveillance and Inclusion

The discussion above on inclusion both as a process and as an outcome presents a juxtaposed view of inclusion within digital platforms subsuming the context of surveillance

The analytical aid of liquidity as used here subsumes the multiple visibilities of data-driven surveillance. Correspondingly, inclusion too is performed across the platform ecosystem at multiple stages. So, surveillance and inclusion straddle meta-organisational contexts being performed through multiple social and technological processes, within governmental and private institutions and across the platforms ecosystem or within a specific platform context. Surveillant dataflows account for how these various contexts are connected. The fragmentation of surveillant visibilities under datafication also reflects the overlap between governmental and commercial surveillance. Surveillance here is less about disciplining undesirable individuals but about keeping undesirables away and allowing the desiring and desirable to enter. Surveillant power also acquires a temporal dimension with a data-driven prediction of future risk becoming necessary to let desirable individuals participate freely within digital platform ecosystems.

This thesis argues for a social justice framing of inclusion as an outcome, since the process of inclusion, along with surveillance, is enacted through datafication under a banopticon (Bauman & Lyon 2013). (see figure 6.4). Extant subordination in economic, cultural and political terms are taken into account using the theoretical lens of 'abnormal justice' (2008).
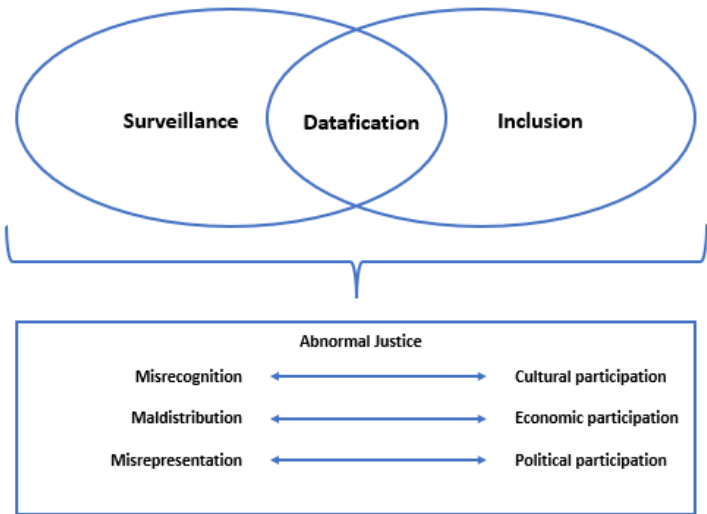

Figure 6.4: Conceptual overview of surveillance and inclusion

Inclusion is cast in this thesis as an intersectional and holistic parity of participation and as a socially just outcome. This view not only calls for questioning the assumptions that justify surveillance in the name of inclusion, it also dictates that the outcomes of inclusion must be intersectionally just. The evaluative vocabulary provided by the social justice lens used in this thesis can then demonstrate that mere inclusion in economic terms is not inclusion in its totality. Moreover, this thesis signals that neither inclusion nor surveillance is inherently positive or negative. It is in the performance seen through a social justice lens that true impact is gauged. Inclusion is only socially just when the surveilled individual is enabled to overcome any subordination, to achieve a holistic parity of participation across economic, cultural and political domains.

An integration of findings from the three papers show that in practice, the major focus is on achieving financial inclusion, and platforms do not address subordination other domains. Datafication and dataflows then mean that this subordination as impact continues across the trajectory of inclusion. Inclusion as an outcome then is a highly networked performance within interrelated economic, cultural and political dataflows. The making of data and allowing it to govern a marginalised individual's participation within platform contexts also fragments the very idea of inclusion. The individual is broken and dividualised into data-double and included in multiple digital contexts. The dominant capitalist rationale means that these data-doubles are rebuilt, analysed and extracted for value, mainly for the benefit of platforms. So, when inclusion fails to live up to the benefit of marginalised individuals, the result is not as exclusion, but discriminatory and unjust inclusion, with their data being extracted for value benefiting other actors in the platform ecosystem. That is, under liquid surveillance, inclusion itself is liquid. It is an ongoing performance of surveillant datafication where the state of being included is not fixed, but a moving goal-post, and in truth can be indeterminate.

6.4. Revisiting Research Questions

The overall aim of this thesis has been to co-position surveillance and inclusion. This was guided by the research question: "*How are inclusion and surveillance, and their paradoxical relationship performed through datafication in the digital platform ecosystem*?".

The three presented papers built on the above question and growing literature on surveillance and social justice. The first two papers used specific cases to explore relevant practices of datafication employing the lens of social justice, with the last paper bringing the empirical data together using a lens of surveillance. Under this thesis structure the research questions of the individual papers are :

RQ1. What is the social justice impact of digital identity and the datafication enabled by it?

RQ2. What are the social justice impacts of the spatiotemporal characteristics of digital platforms?.

RQ3. How is inclusion performed under the datafication and surveillance practices of digital platforms ecosystems?

This thesis has these questions positioning them within the context of India's digital platform ecosystem. The papers and their research aims were structured in a way to capture experiences of surveillance and inclusion at different levels or/and contexts within the platform ecosystem. This reflects the layering of inclusion as discussed in earlier sections in this chapter as shown in the figure (6.5) below, with the numbers indicating that of the paper and research question above. Specifically, the thesis undertook a deeper exploration of inclusion as it plays out under Aadhaar, the digital and biometric identity platform and by querying its digital connection to the gig-economy.
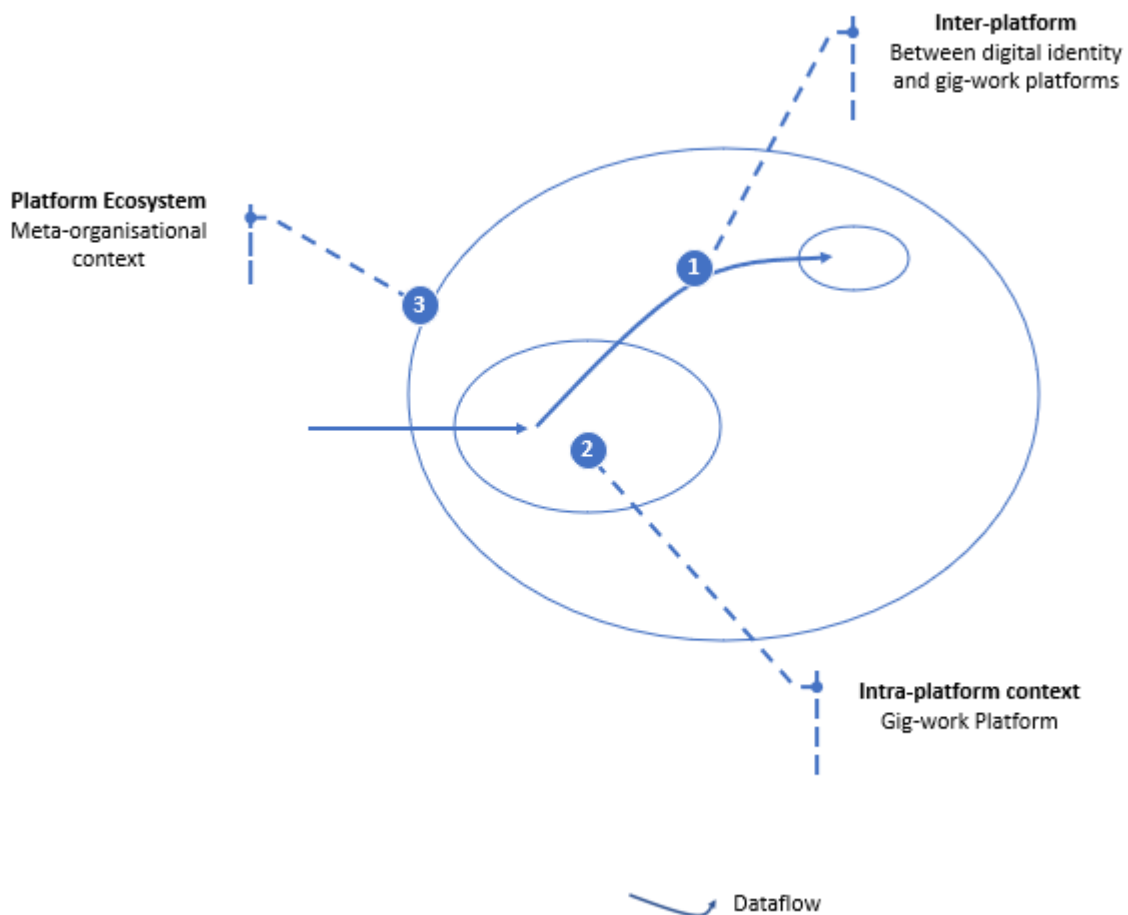

Figure 6.5: Meta, Inter and Intra platform contexts of surveillance and inclusion

The first research question RQ1 sought to understand the outcomes experienced by gig-workers when they interact with the Aadhaar as a digital identity platform. It is positioned in an inter-platform context. The corresponding paper (Krishna 2021) shows that surveillance is enacted at the point of entry into a platform ecosystem using digital identity as a necessary artefact of datafication servicing the needs of the larger digital and gig economy.

The second question RQ2 shifts the setting to their work practices within gig-work platforms, taking an intra -platform context. This was instrumental in showcasing the specific social justice context of datafication within gig-work and how it affects workers. The evidence within the second paper (Krishna 2020) depicts how datafication experienced spatially and temporally by the gig-workers enacts socio-economic marginalisation as they seek livelihood under emergent digital platform practices.

The third question RQ3 connects both the above contexts to show how surveillance practices are intimately connected to inclusion under the overarching view of a platform ecosystem. Taking a platform ecosystem perspective introduces a meta-organisational view encompassing the experience of the workers across multiple platforms. So, in the above set of research questions, while RQ1 and RQ2 present the social justice impact of digital platforms, this is then used to understand inclusion as addressed by RQ3. The overarching research question of the thesis mirrors the integration of these as presented in earlier sections. The corresponding third paper integrates theoretical concepts to position a concept of 'liquid inclusion', where inclusion itself is seen as a fragmented performance of surveillance and datafication, as seen in the above discussion in this chapter.

6.5. Interdisciplinary contributions

The three papers in this thesis presented a discussion of contributions and limitations within their own context. The sections below presents an overarching view of the contributions by this thesis across related strands of literature on surveillance, datafication, data justice, and digital platforms, but the core idea of inclusion which has been conceptualised under all these is a connecting strand. The papers themselves have been published in an ICT4D journal and information systems conference proceedings. Elements of this research have also been presented in conferences across disciplines of critical data studies, media and communication studies, surveillance studies, human geography and development studies, signalling the interdisciplinary nature of the research. In keeping with this the below discussion will present the specific engagements and contributions made by this thesis across these disciplines.

6.5.1. Understanding Surveillance

The principal contribution of this thesis is in theorising inclusion squarely as process and outcome attendant to surveillance. In this, surveillance within the digital platform era has been conceptualised as 'post panoptic' using the lens of liquid surveillance. This view centres the effects of datafication as a feature of platforms and exposes the emerging surveillant forms made capable by the accumulation and control of data. Previous research on surveillance has varyingly presented similar ideas as Big Data surveillance, dataveillance or data-driven surveillance in the context of digital platforms (Andrejevic 2014, Van Dijck 2014, Sadowski 2019). This thesis develops on such research in the context of marginalised people who rarely find a focus in surveillance literature. In doing so, the research picked up the call to understand data-driven surveillance as straddling the 'social' world of the affected human and the 'object' world of the data that perform surveillance (Andrejevic 2014).

The centring of surveillance in this thesis also adds to critical ICT4D and information systems research. Surveillance finds limited presence in information systems research and is even rarer a concept as applied in ICT4D research. These literature have a long history in the critical analysis of power, especially within an organisational framing depicting domination and control (Zheng et al. 2018, Chipidza & Leidner 2019). But there is a glaring dearth of accounts that acknowledge contemporary forms of datafication and surveillance as obvious manifestations of power. In ICT4D literature, the framing remains true to its name. A largely developmentalist notion of how contemporary digital technologies can enable positive benefits remains the chief line of enquiry in ICT4D (Zheng et al. 2018). Even when questions arise of the negative impacts of digital technology on marginalised actors, these are regularly framed as a concern to understand the 'dark' side (Walsham 2017, Bonina et al. 2021). This leaves surveillance, despite being a chief concern, as a side note in such research.

In wider information systems research, surveillance has found a place as an organisational process of managerial control (Ball 2010, De Vaujany et al 2021). Recently, this body of research has widened the perspective to analyse the societal dynamic of surveillance control (Leclercq-Vandelannoitte & Aroles 2020, De Moya & Pallud 2020, Newlands 2021). Further impetus for this line of research has been to confront the changes in commercial and labour practices as seen in the growing presence of the digital economy. Digital platforms and their surveillance capabilities then find a clear focus as a risk to be contended with by centring the experience of those 'whose data are exploited' (Clarke 2019). Newer surveillance paradigms beyond the top-down organisational form find relevance in these studies as they take into account platform technologies like algorithmic surveillance (Jarrahi et al 2019, Newlands 2021) and self-surveillance (De Moya & Pallud 2020).

The use of surveillance theorisation in this thesis forms another contribution in understanding the ethical impacts of digital technology on privacy at the margins of society. Critiques of ICT4D have long surfaced ethical issues, particularly data-protection and loss of privacy in global South contexts (Traxler 2012, Walsham 2017). Privacy, in particular, continues to be a thorny issue in the application of digital technology with its more recent development, such as datafication (Schelenz, & Pawelec 2021). The study of datafication of those at the margins has added further complexity and urgency to the need for upending privacy as an individualist proposition and be considered a relational construct (Arora 2016). An answer to this can be found in this thesis, in the use of 'visibility' as a key concept. The construct of surveillant visibility, particularly that of banopticon, inverts the experience of marginalisation not as one of seeking secrecy such as privacy but as seeking an exposure bracketed by issues of power relations. In conceptualising visibility as a critical developmental analytic, this research borrows from wider studies of marginalisation within welfare surveillance, biometric and border surveillance (Nagy 2016, Ajana 2020) and other governmental welfare interventions (Scott 1998, Breckenridge 2008, Whitley & Hosein 2010). For ICT4D research the concept of surveillant visibility, especially in its multiple liquid surveillance forms, contributes an evaluative framework with which to approach the ethics of what privacy should be in such contexts. The operationalisation of 'liquid surveillance' in this thesis adds a long cited possibility within information systems in conceptualising data contexts. Bryant (2008) called for an early view of liquidity as a critical lens to define information systems. This has been taken up recently again in reframing the changes in work practices and spaces (Hofma et al. 2017, De Vaujany et al 2021). A very useful summary of what liquid modernity offers to information systems research has been presented by Doyle & Conboy (2020) contemporaneous to this research. But perhaps reflecting the larger apathy shown by information systems research to surveillance, the paper does not mention surveillance as a métier of liquid modern lens. But this thesis contributes to bridging this gap by espousing the platform specific view of liquid surveillance, and its connections to social justice as way to critically relook at the purported developmental benefit.

In summary, there is a demonstrable gap between ICT4D and information systems research in how they address similar footprint of technologies. . One side of this gap is ICT4D's developmentalist view of digital technology as a beneficial tool applied in global South sites. The other side of the gap is of information systems research set in the global North regularly raising issues of surveillance risk about digital technologies. This thesis contributes to bridging this gap by flipping the context. Surveillance is placed as a core construct with its new found prowess due to datafication becoming the vehicle for inclusion in global South situations. This view allows for taking a critical role of data generation and the overlap in its commercial and governmental exploitation as a matter of necessity. As demonstrated in the third paper particularly, the shared context of surveillance and inclusion across

governmental digital identity and commercial gig-work platforms becomes key to understand the impact on marginalised populations.

This thesis has also adopted the perspective of data justice to position surveillance as a feature of platforms largely seen in critical data studies and media and communications studies disciplines, and adopted recently in ICT4D as detailed in the next section.

6.5.2. Understanding Datafication and Data Justice

This thesis has used the analytic of social justice, more specifically abnormal justice, to study digital platforms, contributing to a growing body of literature that critically appraises datafication and calls for 'data justice'. The theoretical contribution of this thesis to data justice literature is in the operationalisation of Fraser's (2008) abnormal justice for the digital platform contexts. There have been recent calls to view marginalisation using the 'parity of participation' principle as espoused in this thesis. The call by Gangadharan & Niklas (2019) mirrors a need for an intersectional social justice view, as put forward by this thesis. As Dencik et al. (2019) present, abnormal justice provides a disruptive framing in which underlying structural conditions of injustices are considered imbricated in marginality and its subsequent datafication. Such a view acknowledges extant structures of domination within digital contexts. This line of research particularly helps in 'beginning and ending with marginality' of the individuals that are impacted (Gangadharan & Niklas 2019).

Similar calls to address structural issues are also made within ICT4D research. Heeks & Renken (2018) call for unearthing both in practice and as a theory, structural issues in a datafied society. There have been multiple calls to centre the related themes of subordination and domination in information systems research, presented as a critical theoretical orientation (Cecez-Kecmanovic 2005, Masiero 2020). For instance, Clark (2019) calls for an analysis of 'domination and control enabled or supported by' surveillance and datafication within the gig-economy. In such a context, this thesis has showcased a pathway to address marginality by foregrounding extant subordination of marginalised groups and plotting their trajectory through the surveillant platform ecosystem.

This thesis also contributes to a recent body of literature that uses a framing of abnormal justice to study datafication in the forms of platform surveillance (Cinnamon 2017), algorithmic management and control (Marjanovic et al. 2021) and social media surveillance (Akbari 2019). The focus on inclusion of marginalised in this thesis extends data justice research to global South settings where intersectional injustice as it applies to labour and governmental context are conceptualised. This matches the wider use of abnormal justice framing in the Indian context, where an intersectional claim to justice is seen to be fitting, mainly to account for the complex narrative of extant subordination along the lines of caste, class and gender (Tandon 2021). As the first two papers show

(Krishna 2020, 2021), a key contribution of this thesis is challenging the dominant cultural and political assumptions attendant to the needs of upper/middle class customers which in turn are also reified by platform practices.

The juxtaposing of surveillance and inclusion, as done here finds a place in cognate research that inquire the impact of 'Big data' in the global South. Taylor & Broeders (2015) called for theorising visibility as a feature of surveillance capitalism at the intersection of datafication and development. This was further developed into the data justice framework (Taylor 2017). Similarly Milan & Treré (2019) plot a need to query data justice with datafication and surveillance being rooted in 'historical processes of domination, extraction, exploitation, and oppression'. This is echoed by Couldry & Mejias (2019) in calling surveillant extraction of data in the global South akin to a 'colonial' project, by normalising exploitation of human subjects as data. This research on the whole has provided specific evaluative vocabulary to the study of data justice, by capturing both value based assumptions made within datafication contexts and exploring the myriad impacts created by the technologies themselves.

The constituent papers also deepen understanding of the specific datafication contexts in which they are situated. For instance, the use of banopticon as a construct of surveillant recognition in the first paper (Krishna 2021) adds to an interdisciplinary appraisal of digital identity systems. Recent scholarship such as Weitzberg et al. (2021) have similarly argued for engaging with recognition as an important construct of surveillant power. Similarly, in communication studies, Couldry & Yu (2018) ponder on how datafication can be reconciled with the social relationship that the data models. The answer to this they present is that the recognition of the self and others in the respective datafied forms needs to be done by deconstructing datafication and its connection to surveillance. In such a research context, the contribution of the first paper in this research (Krishna 2021) extends the knowledge further to define recognition as a component of surveillance, datafication and inclusion. A related contribution that the first paper (Krishna 2021) makes is also the positioning of digital identity within overlapping governmental and commercial contexts. Research in ICT4D that study digital identity using lenses of surveillance or social justice focus solely on international development and humanitarian contexts (Iazzolino 2021, Schoemaker et al. 2021), leaving a gap for the theorisation of marginality in everyday practices of digital identity, which this thesis has addressed.

The second paper of this thesis (Krishna 2020) zooms into food-delivery gig-work to conceptualise social justice playing out along intertwined dimensions of space and time. Comparing the 'what',' who' and 'how' nodes of abnormal justice (Fraser 2008), the spatiotemporal justice framing can be considered to extend the vocabulary to the 'where' and 'when'. Additionally, the spatiotemporal framing enriches interdisciplinary research on gig-work (De Stefano 2015, Surie &

Koduganti 2016, Graham & Woodcock 2018) by showing empirical evidence and theorising the algorithmic and data contexts of labour practices under datafication critically.

Further, the temporal lens used in this paper and elsewhere in the thesis also acknowledges the recent temporal turn within information systems literature (O Riordan et al. 2013, Diaz Andrade& Doolin 2019, Wu & Zheng 2020). Particularly the temporal view introduced in this thesis echoes recent call for theorisation in information systems research by Mousavi Baygi et al. (2021) .They qualify that a 'temporal flow-oriented approach' in research, as taken here, will provide an 'innovative theory of socio-technological (trans)formation'.

6.5.3. Understanding Digital Platforms and Ecosystems

The main contribution of this thesis as a whole and specifically as theorised in the third paper is to situate platforms within their wider ecosystem. The thesis contributes to the emerging digital platform research in information systems, ICT4D and in cognate disciplines both methodologically and conceptually.

The use of auto-ethnography set in a global South context, which informed papers 2 and 3 (Krishna 2020, Krishna n.d.) and the overall thesis, is a crucial methodological contribution of this research, particularly in studying gig-work platforms. Recent auto-ethnography experiences detailed within digital platforms research mainly set in global North sites and within a single gig-work platform context (Heiland 2021, Symon et al. 2021). This thesis offers an auto-ethnographic view that spans both governmental and gig-work platforms. By embedding oneself within the meta-organisational ecosystem, the research has followed the trajectory of data through the platform ecosystem's complex social and technological context.

As detailed in this thesis, only a first-hand experience of platforms can help position the individual experience of data and algorithms within the ecosystem. The methods undertaken show a practical way to navigate the digital saturation social researchers face in the field (Soukup 2013, Dunn & Myers 2020). The other end of the spectrum are researchers of algorithms who are confronted by the opaque 'black box' of technology (Christin 2020). A methodological midpoint to this spectrum is sought here using the idea of self-tracking and self-quantification (Lupton 2016, Moore & Piwek 2017). This use of multiple methods of tracking data and algorithmic traces also presents a novel addition to understanding digital research methods (Hjorth et al. 2017), especially in global South contexts and in studying overlap of governmental and commercial surveillant environments.

Conceptually, this research occupies a space within two streams of literature on digital platforms from ICT4D and information systems. In information systems research, essentially, the focus

is on digital platforms as innovations and as vehicles for business or commercial value creation (De Reuver et al. 2018, Jacobides et al 2018, Cusumano et al. 2019). In contrast, a very nascent strand in ICT4D research seeks to explore digital platforms' potential as sites of development (Bonina et al. 2021, Masiero & Arvidsson 2021, Madon & Schoemaker 2021, Heeks et al. 2021). This thesis builds on both these strands to bring into focus the lived experience of platforms where surveillance and marginality dominate and reconciling these using a social justice lens.

The liquid surveillance lens employed in this thesis adds a novel perspective to the growing typologies of digital platforms in academic research. Unlike the emerging typology presented of innovation and transactional platforms - where Aadhar is seen to occupy contradictory positions (Bonina et al. 2021, Madon & Schoemaker 2021, Masiero & Arvidsson 2021) , this thesis adopts a view based on data flows. It posits Aadhar as a 'datafication platform' enabling both transactional dataflows between workers, employers and customers and encouraging innovation by using open standards and generative architecture for the ecosystem's growth, thus expanding the typologies of digital platforms.

Further, the meta-organisational, inter and intra platforms view of surveillance and inclusion offered in this research deepens the social understanding of platforms and widens the categorisation of its mechanisms. It is in taking the view of a platform ecosystem as a whole and not one specific platform, and by plotting the trajectory of individuals within this ecosystem that the breadth and complexity of digital platforms' social impact emerge. Existing literature largely side steps tracking the multiple stages of the impact that individuals encounter as they navigate different aspects of the ecosystem, as this thesis has centred. Such a recasting of platforms' functions adds to their developmental understanding and complements literature from information systems that focus on the socio-technological landscape of platforms (De Reuver et al. 2018, Cusumano et al. 2019).

Surveillance is an emerging interest in platform research within ICT4D (Weitzberg et al. 2021). But despite taking a platform perspective, many ICT4D and allied accounts skirt the ontological reality of surveillance, in positioning the individual's relationship to the platform or the ecosystem. In this body of literature, some cite the risk of surveillance and the capitalist logics that it embodies, buy without substantiating further. This is seen in multiple relevant empirical contexts where digital platforms are employed, such as humanitarian and international development (Cheesman 2020, Iazzolino 2021, Schoemaker et al. 2021), in inclusive fintech (Lagna & Ravishankar 2021), gig-work (Heeks 2017, Heeks et al. 2021) and in government (Masiero & Shakthi 2020).   Even as marginalised users in the global South are becoming one of the biggest consumer groups – cast as the 'bottom of the pyramid' - their surveillance experiences are rarely explicated. This thesis, and the third paper

particularly, breaks the mould by placing platforms as a surveillance capitalist tool, but ones sought by marginalised populations as pathways to inclusion. In this way the thesis contributes to a reconciliation between overt techno-optimistic and opposing dystopian views of platforms.

This thesis's use of liquidity as an analytical framing also contributes to interdisciplinary literature, particularly on gig-work platforms. Research in such literature seeks to understand the precarity brought about by the disembedded nature of employment and algorithmic control of income within gig-work (Sutherland et al 2020, Malik et al. 2021, Wood & Lehdonvirta 2021). This thesis details the conceptual and practical link between fragmentation resulting from datafication of individual contexts and that of the institutions under digital platforms. The analytical framing of a 'trajectory' of inclusion also shows the increasing lack of control of data within platforms, after individuals are nominally included, exacerbates inequality and even cause newer unfair outcomes. Particularly, this thesis shows how individuals are pushed towards a 'prosumer' role to perpetuate data extractive and capitalist motives of platforms (Bardhi & Eckhardt 2017). The use of a liquid surveillance lens demonstrates the connection of individual data to a larger context where governmental and commercial surveillance, and datafication are intimately connected to social security, formalisation, welfare, labour rights and data rights of gig-workers. This observation contributes to understanding how the platform ecosystem has fast become a stand-in for institutions in the global South and particularly highlights related regulatory lapses (Heeks et al 2021).

6.6. Conceptualising Inclusion: Final Remarks

Inclusion is the underlying concern that connects the multiple contributions of this research. The most pertinent of these contributions is towards ICT4D literature. Over the past 20 years, the conceptualisation of inclusion within ICT4D has evolved from being merely about access to technology to surfacing concerns with the social impact of traditional monolithic information systems (Warschauer 2004, Trauth & Howcroft 2006, Zheng & Walsham 2008). Recently, scholars have called for a reframing of the construct of inclusion acknowledging platform capabilities by clearly foregrounding the capitalist and commercial interests that form the basis for digital platform technologies (Zheng et al. 2018, Zheng & Walsham 2021). This thesis answers this call by situating inclusion within and traversing the wider platform ecosystem, which in turn, is placed under a surveillant capitalist (Zuboff 2015) agenda of extracting value from data.

The thesis acknowledges what Chipidza & Leidner (2019) argue is the 'reality' of ICT4D technologies - that digital technologies include a 'nefarious' means of surveillance despite being aimed at delivering inclusion. This reality rarely finds deeper analysis in ICT4D, which this research has addressed by espousing theories of surveillance as the starting point of explaining inclusion, framed

by theorisation of social justice. In this, the thesis follows Avegrou's (2017) call for ICT4D research to employ a combination of multiple theoretical strands that conceptualise both foundational issues of socio-economic change at an abstract level and detail actual mechanisms of change specific to a research context. She argues that only such an approach can break the techno-optimistic mode of research and seek out the true empirical origins of development. The thesis answers this call by framing socio-economic development expected of inclusion using social justice as a foundational theory. Then, it probes using a surveillance lens for the actual mechanisms that perform data-driven inclusion. With such a perspective, this thesis offers an opportunity for ICT4D and information systems research to frame surveillance, not as a dark side note, but as a (known) necessary (d)evil, centred in research and understood in detail. Similarly, inclusion's techno-optimistic hue is shorn off to understand it as a performance of surveillance in its many forms, helping unpick the experience of marginalised more accurately.

A nascent intersectional perspective is found in ICT4D (e.g. Jiménez 2018), but inclusion (and 'participation' as conceptualised here) still largely retains its financial framing (Zheng & Walsham 2021). This thesis interprets inclusion as intersectional participation using an 'abnormal justice' as a lens to detail the economic and non-economic impact of digital technology on marginalised populations. In order to do so, it draws on scholarship on data justice and, is also inspired by wider research on participation within communication and new media studies, which regularly invoke intersectional feminist or social justice lens (Fuchs 2014, Banaji 2017a, Lehtiniemi & Haapoja 2020, Nanditha 2021). Thus, the thesis responds to the need for an intersectional substantiation of underlying political and economic power structures and the cultural terms of engagement in digital platforms (Fuchs 2014, Banaji & Moreno-Almeida 2020). Additionally, in Indian society, the pervasive presence of caste stresses the need for an intersectional view in any analysis of society. As Banaji (2017a) explains, ICTs in India are necessarily experienced through the construction of 'intersectional identities' across complex caste, class and religion divides. While caste usually doesn't find presence in a largely global North research vocabulary, the use of an intersectional social justice lens (Fraser 2008) allows for caste to be considered in research (Tandon 2021).

Further, the findings add to the body of literature on information systems (eg. Maseiro & Arvidsson 2021), showing evidence that Aadhaar has caused exclusionary outcomes. The intersectional view of inclusion offered in this thesis extends this critique by showcasing the exact mechanisms of, and contexts within, the wider platform ecosystem involved in construction of inclusion, and how these can exacerbate the subordination of marginalised users instead of bettering their condition. In this, the perspective offered by the thesis contributes to understanding failure of inclusion in complex ways. The social justice view used here can take into account ideas of adverse incorporation (Heeks

2021), abandonment and disempowerment (Masiero 2021), disconnection (Treré et al. 2020), and coerced digital participation (Banaji 2017b, Barassi 2019).

Across this chapter, multiple characteristics of inclusion within digital platforms have been presented as conceptualised by this thesis using an overlapping lens of surveillance and social justice. Resulting from this, the research provides a conceptual vocabulary to understand platform surveillance and datafication practices across its ecosystem. By understanding dominant narratives of defining inclusion and identifying subordination under it, this research calls for the importance of intersectional social justice in outlining inclusion. As wider platform practices now stand, claims to a 'just inclusion' that can overcome the subordination inherent in surveillant capitalism is not easily possible. But this research can offer a way to explore in detail the cultural assumptions that go into datafication, and the political governance of platforms' practices, to match the predominant focus given to the economic impact of digital platforms.

The last chapter of this thesis discusses limitations and wider implications and presents a summary of the research .

7. CONCLUSION

This thesis has presented how surveillance and inclusion are co-positioned as functions of datafication within digital platforms using the twin lenses of 'liquid surveillance' (Bauman & Lyon 2013) and 'abnormal justice' (Fraser 2008). The research answers the overarching research question: "*How are inclusion and surveillance, and their paradoxical relationship performed through datafication in the digital platform ecosystem*?". The research has detailed the intricate connections between surveillance, datafication and inclusion, as was observed in the empirical context of three groups of informal workers. These were domestic-workers, cab-drivers and food-delivery workers seeking livelihood within the digital economy using Aadhaar, and working under 'gig-work' platforms. The research traced the experiences of these workers across the digital platform ecosystem using three constituent papers, each contributing to understanding a specific aspect of the ecosystem.

The first paper in this thesis (Krishna 2021) began with Aadhaar as the starting point of datafication. Here the digital identity is used by domestic-workers and cab-drivers respectively in seeking employment with job-recruitment portals and gig-work platforms. In this context, the use of 'abnormal justice' (Fraser 2008) depicts that the social function of surveillance is in the seeking of 'recognition' by the marginalised individuals to participate in society through their identities. The actual impact is found to be unequal across economic, cultural and political domains. The paper details the worsening of the marginalised workers' extant informal status even when more formal actors such as platforms, companies and their upper/middle-class clientele benefit. Overlapping dataflows between governmental digital identity and the commercial aims of private-sector digital platforms exacerbate inequalities faced by marginalised populations.

The second paper delves deeper into the impact of participation within food-delivery gig-work platforms. The gig-workers experience is framed using a lens of social justice and it's connected to the wider thesis to show how digital platforms capitalise on datafication practices. The findings show that the spatial and temporal aspects of gig-work, laden with cultural assumptions, are datafied in a manner disadvantageous to the workers. Flawed digital representation of physical work contexts, asymmetrical processes of data-driven surveillance and its attendant value creation, and unfair spatiotemporal measurement of work conditions are all seen to propagate inequities faced by gig-workers. The 'spatiotemporal (in)justice' construct presented in the paper reflects the inequality in assumption and practices within digital platforms that prioritise benefits for customers and platform companies, which adversely affects the gig-workers.

The third paper takes a step back and offers an overarching view by taking a platform ecosystem level view of inclusion. This paper and the thesis at large extend the understanding of 'inclusion' by centring surveillance and datafication as functions of digital platforms. Inclusion is understood not just as access into the digital economy but as the navigation of the complex impact of marginalised individuals being cast as data. The third paper presents the characteristic of inclusion under a 'liquid surveillance' lens (Baunman & Lyon 2013). 'Liquid inclusion' as conceptualised shows that participation is afforded to marginalised workers by a liquefaction of their identity and work. Workers are increasingly cast as datafied profiles and undergo continuous processes of self-surveillance to remain qualified to be included in the digital economy. A fragmentation of their work context is also seen. Instead of an employer-employee relationship, the workers' livelihoods are based on flexiblised employment and fragmented welfare, which are defined by the episodic performance of gig-work and the production of data within it by the workers.

This research deconstructs surveillance as being performed by multiple visibilities and beyond the usual monolithic metaphor of a panopticon. Inclusion as a process within the digital platform context is seen as a function of surveillance under the 'banopticon' that acts as a border in determining who is eligible to enter and fencing out undesirables. Individuals perform self-surveillance under the banoptic rules to showcase their eligibility to be included. Once they cross the border, 'synoptic' surveillance takes over to entice those included into parting with more and more data. Inclusion, in this view, is performed as a data-driven process across multiple layers of the platform ecosystem. Each of these layers can act as a banopticon. In such a situation, any number of intervening banoptic conditions can redefine the path to an indeterminate inclusion. So, data-driven surveillant inclusion itself is a moving goal-post with individuals undertaking an ongoing performance of surveillance and datafication in the hopes of achieving inclusion.

Inclusion is further conceptualised as an outcome of social justice using the three dimensions of participation within 'abnormal justice' (Fraser 2008). The impact on marginalised individuals being included into digital platforms is evaluated across economic, cultural and political domains of participation. Under multiple banoptic surveillance measures, a nominal inclusion into the digital economy is achieved, even if it is not holistic. This nominal inclusion is aimed at financial betterment, as in the case of the workers studied in this thesis. The platforms do not address subordination within other domains of participation and can even worsen the inequity faced by the workers. The trajectory of inclusion seen across the thesis begins with an assumption of cultural suspicion of informal workers. The workers themselves seek economic inclusion, but datafication pushes them to lose political and procedural control of their personal data across the platform ecosystem. Further loss of control of data is seen when platforms capitalise on data production by the newly included marginalised individuals

and direct them to be better consumers within the wider platform ecosystem. The impact of the datafication then means any subordination carries forward in the data produced by the workers and governs their commercial activity with the platform ecosystem.

The findings and theorisation presented in this thesis add to an emerging critical view of digital platforms (Bonina et al. 2021, Masiero & Arvidsson 2021). Mainly the findings here bridge the 'surveillance capitalist' (Zuboff 2015) view accorded to digital platforms largely in the global North, with developmentalist hopes pinned on the same technologies in the global South (Heeks et al. 2021, Zheng & Walsham 2021). So, the thesis contributes to ICT4D and information systems literature by centring surveillance as a necessary experience faced by marginalised individuals when seeking inclusion within digital platform contexts. The research also adds to cognate fields of critical data studies, surveillance studies, human geography and development studies by showcasing experiences of data-driven marginalisation and its connection to governmental and private surveillant contexts.

7.1. Limitations and Future Research Paths

There are certain identified limitations in this research. The main challenge for this thesis was that Aadhar as a digital identity program changed considerably between the time I proposed this thesis and by when the fieldwork was undertaken. This was seen mainly in the increasing breadth of the platform ecosystem with which Aadhaar was in intimate interaction. Even after the connection of Aadhaar as a digital identity being used within gig-work was noticed by me and chosen as the case study for research, the specific context of this case changed rapidly. This was due to the emergence of newer platforms, technologies, and policies that changed the research context. To respond to the developing solution as a matter of research interest, I made a conscious choice to change the study's framing involving analysis of the complex platform ecosystem. But still, the research design centred experiences of individuals as gig-workers forming a marginalised group within the wider platform ecosystem.

Another experience of the frequent changes in platform ecosystems affected the research process during the fieldwork undertaking auto-ethnography as a gig-worker. ■■ ■■[8]. Contending the many moving parts of the platform ecosystem has meant that a deeper analysis of specific context was impossible. However, this issue was mitigated by the research framing chosen in papers 1 and 2

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[8] Redacted after the viva and in final thesis for data protection purposes.

(Krishna 2020, 2021), of separate empirical contexts. These frequent changes in the research setting is also perhaps further evidence of the 'liquid' nature of platforms. But in practice adapting to this issue as a researcher was a huge challenge.

An allied issue to the complexity of the empirical setting in this research is that there were many other stakeholders beyond the gig-workers who were identified. These include government employees involved in Aadhaar implementation, welfare beneficiaries who are not gig-workers, customers and employers seeking services on job recruitment portals and gig-work platforms, technology creators and platform managers. For the sake of brevity and need to prioritise the voices of the marginalised workers, these other stakeholders do not find any representation in this thesis other than in relation to the gig-workers themselves. This is evident in the first paper, which initiated pilot interviews of platform employees and non-gig-worker domestic workers. But as the research progressed, the focus turned more towards gig-workers

This perhaps is a direction for future work on how digital platforms can be framed in research. Acknowledging these various voices will provide a rich narrative of competing viewpoints that can better foreground the disconnect between dominant and subordinated voices within platform ecosystems. Such issues have already become public, with restaurants banning food-delivery workers from using toilets that are only meant for customers (News18 2021) or women gig-workers facing similarly problematic working conditions while contending with additional issues of safety (TheLeaflet 2021). These are in fact global issues often repeated about delivery workers in the UK having no access to toilets. But in India the specifics of the intersectional caste, class and labour positionality needs closer analysis. This thesis has introduced the building blocks for such a research but has not extended these ideas empirically. For instance, there is a clear gender divide between domestic workers and cab-drivers or food-delivery workers as interviewed in this research. But a gender led framing remained outside the scope of this research.

A related limitation of this research already acknowledged in earlier section is the researcher's own positionality. The decision to undertake auto-ethnography was made despite I as the researcher being a member of a culturally privileged group and having gained economic class mobility. The observations done within auto-ethnography, despite being a novel contribution, was in a context where I, as an ethnographer cannot comment ethically or even knowledgeably on personal and direct experiences of customary or entrenched forms of labour subordination and servility. This gap needs critical and sensitive attention of future researchers, to present a truly representative voice within research on gig-work in India.

7.2.Implications for Policy and Practice

The complex mapping of how dataflows create potential discrimination of already marginalised individuals has definite implications for India's policy environment and for practitioners such as data rights activists or labour union leaders.

First, this thesis is evidence that here is an urgent need to define and regulate where any platform begins and where its influence must end. There is a large increase in services in the recent year that depend on the data productive capability or Aadhaar. The prime example of this would be the evolving Data Empowerment and Protection Architecture (DEPA). DEPA is conceived as the superstructure that will form a consent layer, from all discernible reports, on top of every platform that connects back to Aadhaar (NITIAayog 2020). Here DEPA is supposed to 'empower' the individual user by allowing granular informed consent so they can share their data and benefit from it financially.

The thesis points to the effacing of the public-private divide in the governance of and by digital platforms. This has been seen under India Stack (Dattani 2020), and now increasingly within DEPA. There is urgent need to challenge DEPA as a public-private venture specifically by countering the valorisation of datafication made as the solution for all of societal issues. Specific assumptions made within DEPA about consent can be directly addressed by the evidence in this thesis. DEPA allows for data consent managers, who are consent intermediaries, to build trust ratings of data and data subjects. Findings in this thesis about digital trust and credit platforms and their use of Aadhaar show that such algorithmic processes easily perpetuate the socio-culturally dominant view. In this context datafication can replicate the dominant view to wherever the data gets shared. To this is added a confounding layer of informed consent. The entire model is actually based on individual and granular informed consent managed by a wider ecosystem of platform partner entities. A consent-based wide sharing of data under DEPA is supposed to stimulate an easy exchange of data-driven commercial activity. This thesis shows that as a procedural tool, 'informed consent' fails to work for marginalised populations (Krishna 2021). This calls into question the intended outcomes of DEPA, which, if continues to be solely consent-based, is poised to exacerbate data-driven inequality driven by a loss of control of personal data for millions of marginalised individuals.

This also signals a further need to map out the complex ecosystems of data-sharing, especially if public data will be involved in helping architecture like DEPA to make sense of the users within it. The problematic nexus of public policy that uses private data is already shown in this thesis where gig-worker's welfare and social security depend on their generation of data within gig-work platforms. The control of such private data is retained within platforms. A pertinent question here is also from a rights perspective. If the boundary between private and public is effaced, there is a gap in defining what

constitute the limit of data rights. For instance, a valid question is where does India's right to information act apply in case of DEPA's trust scoring or the underlying data being used by the algorithms? In the absence of data protection, data literacy and effective consent practices, DEPA's approach to credit will leave the marginalised individuals exposed to exploitative data practices. In short, DEPA envisions that an obstruction of 'free flow in data' within the digital economy is the main barrier to value creation at the individual level, rather than defining a safety net for data-subjects applicable across the platform ecosystem (Kathuria 2021).

As a wider issue, Aadhaar is employed by various governmental agencies to constantly push for greater surveillance capabilities. State overreach of surveillance and anti-minority actions already implicate Aadhaar as a surveillance tool. For instance, the checking of Aadhaar as a document becomes routine in militarised 'cordon and search' activities by police raising well founded fears of religious discrimination (TNM 2021).Linked to this is the discrimination faced by minority communities in India's border states, where their citizenship is challenged in the recently invoked 'National Register of Citizens' and hence they are denied Aadhaar (The Hindu 2020b). This is despite Aadhaar being a 'resident' identity and not a 'citizenship' document. Even in this, Aadhaar seemingly aids datafication of surveillance done under the umbrella of law enforcement. Multiple law enforcement agencies have sought to create digital and biometric profiles of first time offenders using Aadhaar and police have also sought, and been provided access to Aadhaar's biometric data for investigations (The Wire 2018). Moreover, governments continue to seek the mandatory linking of Aadhaar with social media profiles to deanonymise online users (Banaji et al. 2019)

Two parallel actions can be identified for data rights activist and the wider civil society in this onslaught of governmental and commercial data-driven surveillance. The first is to demand accountability for the monetisation of personal-data from governmental and private players alike. The second is to demand transparency from governmental data-sharing arrangements. A page can be taken out of recent efforts in the UK. Cab-drivers and worker collectives have approached courts and used procedures set out in data protection law to successfully force Uber to partially reveal its algorithmic practices and access their own personal data. (Privacy International 2021). But India's lack of data protection law is a barrier for such action as it stands today. While some of these would be resolved under a well-defined data-protection regime, the bigger concern is that India's pending data-protection legislation is already mired within a discussion of DEPA. In the absence of data protection, such issues can only be ameliorated by promoting advocacy for data-rights among vulnerable populations alongside data-literacy. This has been highlighted in this thesis again as an issue of procedural justice. The current regime of data governance in India has focused mainly on imparting digital financial literacy (BusinessStandard 2016), working as a proxy to improve uptake of digital

payment. This leaves out a large gap in the individual being able to protect themselves as data subjects even as they participate economically within digital platforms .

The above mentioned issues of datafication and as showcased in this thesis also have a direct bearing on how gig-workers specifically fare in the future. In the current situation labour activists and unions are actively encouraging participation of the informal workers in sharing data to the government by registration on a portal meant for social security and welfare policies. Gig-workers union have been setting up national registration drives to maximise the registration of cab-drivers and food-delivery workers into the National Database of Unorganised Workers (Business Line 2021). While this is a necessity due to the way the eligibility is framed, it deepens the vulnerability of the informal workers. This drive toward participation has to be matched with a conversation on data rights. At present the policy environment is not conducive in India for collective action or data-rights specific activities such as establishing a data-cooperative. Communicating a data rights agenda effectively can help marginalised workers identify the value of their own data, and how it can be put to use for their own benefit. Recent fledgling efforts by data activists that explore collective and community based solution like 'data trusts' can be valid ways in which marginalised populations like gig-workers can wrest back control of their own data from platform companies and even the government (Medianama 2020). This will help these workers recognise and negotiate exploitative and data extractive practices that are both existing and fast approaching in the future. Only the creation of an avenue for data rights and the assertion of the same, will actually lead to a holistic just inclusion under digital platforms.

7.3. A Note on the COVID-19 Pandemic

By addressing the issue of digital identity and gig-work jointly, this thesis also adds to a topical debate on the role of digital platforms during and after the ongoing COVID-19 pandemic. While this research's data collection ended at the start of 2020, the findings strongly relate to the issues seen during the pandemic.

The pandemic response in India has centred in many instances Aadhaar, gig-work platforms and their overlap as solutions. Gig-workers, particularly cab-drivers and food-delivery workers, became the de facto frontline response for logistics during the pandemic within many governmental programs, charitable activities by commercial entities, and informal personal contexts. This is yet another role that the workers played during the pandemic which also related to their data profile governed by their Aadhaar identity. Aadhaar was also swiftly positioned as the most common proof of identity when instituting a digital platform for vaccination and its certification and a digital smartphone app for contact tracing (Medianama 2021). While the use of Aadhaar was not mandatory by law, it was seen as required in practice until recent times (HT 2021). Here vocabulary made familiar in this thesis, such

as 'verification' and 'linking' of Aadhaar to an individual's vaccine status, has become common. Gig-workers perhaps saw the first impact of these surveillance capabilities building up during the pandemic. Gig-work companies moved to mandate the use of contact tracing apps by their workers, undertook mandatory integration with the COVID-19 vaccination platform to display the vaccination status of workers to the platform's customers (Inc42 2020, Olacabs n.d). The experience of gig-workers during the pandemic mirror the issue discussed in this thesis. The additional and unfair health surveillance that the workers face during the pandemic is mired in the cultural suspicion of workers and only heightened by platform companies assuaging their customers.

The experience of gig-workers during the pandemic mirrors the changing surveillance capabilities provided by Aadhaar, which has been buttressed by questionable consent practices. For instance, newer health surveillance programs and further problematic examples in the misuse of data have surfaced. Programs of mass facial verification, using UIDAI data within vaccination drives, have already been piloted and with plans for their extension (Inc42 2021). There has also been further datafication by creating a 'national digital health identity' for citizens. But evidence shows that the Indian government has created these new identities without the individual's consent by using the COVID-19 digital platform data linked with Aadhaar (NH 2021).

As this thesis shows, the growing inequities faced by marginalised workers within digital platforms result from rampant datafication. But these gig-workers are only unwitting vanguards for what the rest of society will soon undergo given the growing normalisation in data-driven surveillance seeping into the wider public contexts. Gig-workers, and many marginalised communities, already face the impact of India's ongoing transformation as a surveillance society and its pervasive tactics. These surveillance mechanisms now ride on the back of the pandemic's exceptionalism, all of which have been in the works for many years, and built on the nefarious success of Aadhaar's datafication.

8. APPENDIX

8.1. Research information Sheet

What is the aim of this research?

This research is part of a PhD being undertaken by Shyam Krishna (the researcher) into the ways in which digital technology is shaping contemporary work practice. It looks to develop understandings of the interactions between human and digital technology like mobile apps in the work process of food delivery. The research aims to investigate:

• The ways in which humans and technology interact to create an experience of work as felt by you, the 'rider' in using mobile app for food delivery.

• The way technologies changes process of work allocation, its effects on livelihood and way the economic and non-economic benefits of work are realised by the rider.

• The way technology is fair or unfair to the different groups of people involved in the transaction of food delivery.

What does participation in this research project involve?

Participation in this research project will involve:

    • Taking part in interviews with Shyam (the researcher) at a public place or café or any neutral location of our choosing, at a time to suit you.

How will my data be used?

Your data will become a part of the research into the ways in which digital technologies are impacting work and livelihood. You will be asked if you consent to the use of your data in the research project (in the informed consent form), which will then be written-up, with all data being anonymised to protect your identity.

Is it confidential?

All participants' involvement in this study will remain anonymous. Shyam will not share any data to the food delivery company you work with. Your details such as name and other identity information all will be kept confidential and will be anonymised when research output is written up. The interview contents will be only seen and handled by Shyam and no one else.

How Secure is my Data?

All information will be kept securely, in line with the GDPR/ Data Protection Act 1998. All hand- written notes will be kept in locked storage to keep them safe, whilst all digital notes will be encrypted and password protected on a separate computer that will only remain in a secure place with Shyam. This will assure the safety of the research, and these notes will not be made accessible to any third parties, or any other participants in the study.

What happens now?

If you have expressed an interest in taking part in this research, then Shyam will be in contact with you over the next few weeks to ask you some questions about yourself and your availability via telephone (number TBC) or in person.

Will I be paid for this interview and my time?

As part of the project you will be paid for only the number of hours interview and interaction that happens and it is to be only as a compensation for lost work during your work-day as a rider.

What if I want to withdraw from the study?

You are free to leave the study at any point and withdraw from the data collection process. In order to withdraw, please feel free to contact Shyam - via telephone (number TBC) or in person, and this can be enacted immediately.

8.2.Data Analysis: Themes and Codes with Sample Data

The table below shows hierarchical template with the themes and sample codes against the data. Here the short codes actually used are replaced with their longer and more explanatory description.

Paper 1

1. Cultural recognition
1.1 Seeking individual recognition
1.1.1 Obtaining formal/legal inclusion
Workers seeking documentary proof of identity If you are driver Aadhaar card is must… I always have it in my pocket. They nowadays check Aadhaar like they check driving license in many situation… **Satisfying formal identity needs (bank, subsidy etc)** I was told only if I give Aadhaar I can continue getting [subsidy] through bank. I signed up [to Aadhaar] immediately.
1.1.2 Governmental and private context overlaps
Blurring of mandatory vs voluntary (during onboarding into platforms) "When I joined, they gave me the name and mobile number of this person. He takes all your documents and sets up everything. I only have to go to the office after he says… Login and password [for the gig-work platform] was given by him over Whatsapp… He instructed me to not changed [the login email used or password]." **Online verification of Aadhaar identity (under UIDAI)** We call the Aadhaar API to see if the name and age match, what is in the government records associated with this number. We get a binary response from that and then we show the outcome of the binary response to the employers.
1.1.3 Establishing/demonstrating identity
Seeking membership to union/group We set up this [drivers' union identity card] to show that we are part of the [union]. It is useful as it make drivers more relaxed on road. Other than the sticker [on the cab] we don't get any proof of working for [the cab-hailing platform company]. Only attaching the cab, wearing [all white uniform] and using the app is proof that I work as a driver. If there is like an identity card to show that would be good… I hear that [another food-delivery company] give cards to their workers. But nothing like that for us.
1.2 Lack of trust among stakeholders
Recruiters expect Aadhaar for 'blue-collar' jobs Because [Aadhaar] an universal identifier it can be useful to create a greater amount of trust between the ['blue-collar'] job seeker and the employer, because the employer can have greater recourse [to safety]… **Absence of formal mechanism for workers knowing employers/customers** All these big changes that drivers see are one-sided. By working on the app we do not get any safety. There are many [recent news stories] of drivers getting attacked and cars being stolen. But we have

to depend on the OTP only. That doesn't say anything about the customer. They can be anyone. OTP only tells me that this is the person who [requested the trip].

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2. Economic redistribution

2.1 Monetisation practices

Monetisation of worker personal data (by targeted ads and services)

We kind of have a special place [*for Aadhaar*] in all this - for the fact that it can be digitally verified and so gives it a greater potential for value for use, in terms of showcasing the job seeker in a more interesting manner commercially than other forms of identity. (DPL1)

Workers coaxed into using platform specific digital payment (wallets and other offers)

[Platform company] kept asking us to use [digital wallet]. They told us it will be faster to get the money in my account with this… But we face even further delays. It only makes money reaching my account ever longer.

2.2 Digital Financial Ex/inclusion

2.2.1 Cashlessness as inclusion

Cash on delivery pushed by platforms as convenience for customers

I installed [digital payments app] about 1 year ago as it was meant to be necessary for us… Customers are only slowly taking it up. If you see some older people, they get cab booked by their children and cash on delivery works for them. It is also easy for us. But [platform companies] have been make it difficult with limit on how much cash I can hold.

Cash needs regular deposits into platform bank account.

Before work [on digital platform] cash is easy to get in hand we can spend it. But [platform company] force us to go deposit money into their account every day… If I plan and have some [right level] of cash in hand and account balance all is smooth. If this is not done I have to borrow cash or ask someone to transfer to my bank account, just to pay the [platform company]

2.2.2 Income and financial uncertainty

Continuous fall in income levels for workers

We were all attracted by the promise of high incomes in the beginning of this job [with platform company as a cab-driver]. But as the changes kept coming we fell the crunch of falling income…

Regular cash crunch for gig-workers

At the end of day if there are too many digital payments we may have most of the money only with [the platform company]. This happens often… I would have earned Rupees 1500 in that day with half caught in my [platform company] account. If I spend money to put petrol even for being ready for the next day I will have nothing left in my hand to spend.

2.2.3 Adoption of digital payments

UPI presented as an ease of use for workers

While I was joining as a driver the [intermediary] helped me set up the digital payment. UPI needed to be done but was done immediately… My bank account was already set and [the intermediary] installed [digital payment app] in minutes, and I was able to join the company.

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3. Political / Procedural representation

3.1 Issues in redressal processes

Consent routinely signed without workers getting clear information
At Aadhaar [enrolment centre] we fill in form and sign where they ask… At [platform company office] we were asked to sign something but I did not get a copy. I don't think they share it with us.
Secret OTP regularly expected to be shared (within platforms practice)
Ask anyone and they will have given OTP to someone within [the platform company] while joining this job. Only later I was even told that this was a 'secret' number… Not much idea on this as we only looked to get into the job and did not get information of such issues.

3.2 Language and literacy issues

Risk of intermediary involvement in onboarding gig-workers
I have not signed anything with the [platform company]. All was setup for me by [an intermediary]. He acted as an agent, I think. He approached me… and setup everything including installing the app…
Consent/contract terms presented in English
Most of [this process] is in English and [the intermediary] was the one who explained it to me. Even others who went to the [platform company office] directly don't get any information in Tamil except when you talk to the people in there.

Paper 2

1. Trade-off between space and time

1.1 App design issues

Over use of haptic actions/alerts and alarms defining multiple tasks
There is constant alarms and bells. All of [us gig-workers] know the sound and immediately respond to the sound.
Speedy actions expected and push for quick decision by workers
I almost never know where I am going when I accept the order. Once I login for the peak time I just focus on quickly accepting orders. Anyway it barely gives me few seconds.

1.1 Platform targets and metrics

Diminishing income as daily/weekly targets progress
It will become in many clear that as Wednesday, Thursday comes if I will hit the minimum guarantee for that week. After that it become more and more difficult to reach… You may even have seen that meme [a platform company] worker sleeping with this helmet on. You saw that?
Disqualification conditions erases progress towards targets
I would have tried so hard that week and finished so many orders. But if one or two customers, who know what their problem is, if they complain, that's it. Fully over. Then I can't do weekly [progress to the target]… Maybe I can try the daily minimum guarantee next day.

1.2 Spatial / temporal balancing act

Location or address hidden forcing workers to accept work
In this [specific food delivery app] the house location is not known until I mark food ready. But [the other app] shows when the order comes in. I used to work in that app. This one is very difficult now.

Tightly timed actions undertaken while riding on road
Mobile phone is always in front as I have to make sure order is on time, I mark food ready, or attend customer call… Everything needs to be done quickly. There is pressure as someone is waiting for their food.

2. Gig-work digital representations

2.1 Issues in digital representation

Longer distance driven/time taken to accommodate issues by platform or customer
Some customers will mark end of the road and say come to this place or that place inside in the area somewhere. We have their food in hand. We have to go and deliver. If not they will mark 'food not delivered' and the total money for the order would be lost.

Location mapping issues faced by customers passed on to workers
The biggest issue in map is when it's gated. There is a ladies hostel [part of a college campus] here. The women cannot come out and they mark the gate at the end of the campus. The security ask you to get off the bike and walk and give the parcel.

2.2 Knowledge production by workers

Cultural and local knowledge of workers in use of restaurants, food and locations
As you work more and more on this job you know all the peak times. In which area which time what food will sell fast… Sometime if you don't know all this getting orders is very difficult.

Workers negotiation of local routes and traffic incrementally captured by platform
After picking up order at the restaurant app will ask how traffic was, if restaurant was crowded and all that. We are the one who give all this information [to the platform company].

2.3 Platform control of productivity

Algorithmic prediction of delivery and driving time
The app will say random things. After customer doesn't answer we mark it on app, it will still say stay until a specific time. How they say this I do not understand. Some calculation they do. But only makes me late during peak hour.

Frequent and complex changes in income calculation
The [income targets] scheme can change anytime. It was changed weekly sometime ago. Now they give daily different offer… During festival times, weekends there is always newer schemes.

2.4 Platform imposed behaviours

Platform impose congregation near busy restaurants
During training itself they tell us to go to busy areas… For instance, Besant Nagar beach area has so many restaurants. Around evening time is perfect if I go near that [famous restaurant]… Many of us wait there soon after office time is over.

2.5 Material and physical working conditions

Additional risk on road (such as rain or hot sun not accounted for)
They have to switch on extra rain pay… We may have to call them up and tell [the platform call centre] that it's raining heavily here that why order is late…

3. Customer-worker asymmetry
3.1 Asymmetrical surveillance practices

Continuous visibility of workers to the customers
The apps tells customers a specific delivery time and shows where I am going and what I am doing throughout. I know some customers who order and keep tracking all of that.

Tips and incentives are linked to 'best' rating given by customers
I always ask for 5 start ratings the extra money is always useful… My rating about the customer I don't know what it does. It is just another thing I do. Same with restaurant. If I give bad rating I know it won't affect them at all.

3.2 Unpaid labour and data production

Parcelling food at restaurants in most orders during peak time
At peak lunch time at this [famous fast food restaurant], there is a queue to get token showing my [platform order], then go get the food. Th restaurant makes this queue for their own ease. But it can even be to get the parcelling done and get chutney and sambhar [as side dishes for the main food]. We are forced to help or push to get this done fast usually.

Workers act to provide customer service and resolve issues
Once I take order, I am the delivery boy. I also have to do customer service as customers ask be about payments and food issues. The only thing I don't do is cook the food. But sometimes even that, as some customers ask me to check if the restaurant put the right food inside the parcel.

Paper 3

1. Datafication of identity
1.1 Data aggregation by platforms

Absence of consent in sharing data (initial years)
I think I signed something when I got Aadhaar but when I had to give the proof to [the platform company] I did not sign any contract or document.

Database of personal records for 'blue collar' workers across the ecosystem
  Aadhaar has now been issued to 104 Crore people in India, and since the 12-digit number does not change over an individual's lifespan, if all professionals are verified and registered using one common network, Aadhaar helps in unification of "incidents" and "reputation" of professional, thus enhancing accountability. (OnGrid 2016)

1.2 Self-surveillance practices

Platforms push to submit Aadhaar as mandatory during onboarding/registration
Aadhaar is listed first in the along with driving license and vehicle documents… I was not told how Aadhaar is used. But just as I have given to bank I gave as ID proof.

Time limited OTP based verification for each transaction
Without OTP nothing happens in this job. I had to provide OTP for UPI first time and every time I pay using [digital payment app]… Aadhaar, if I take it out there is a need to provide OTP.

1.3 Sharing personal data

Paper use of Aadhaar to verify and submit personal information

I have given paper copy of Aadhaar to bank, [platform company]… I usually sign it and provide my mobile number if they want to check anything. But I can even send the photo by Whatsapp. They just need the address and photo to check if its me.

Verification of personal data shared across systems/platforms
Personal Identification Information: At many different points of time while using our platform, you may be asked to provide personally identifiable information. We seek or collect, amongst others information such as your name, mother's name, father's name, password, date of birth, gender, signature, marital status, nominee details, email id, phone number, educational qualification, bank account details, any other Information that you provide during your registration process or to use any services etc. That helps us to confirm your identity and facilitate provision of the Services through our platform…
In case you are required to provide any proof of identity card (Voter ID, Driving License, Aadhaar etc.) details to us during account creation, you acknowledge and agree that the act of providing your identity details to us is voluntary. (Betterplace n.d)

2. Profiling and sharing of financial data

   2.1 Creation of worker financial data profile

Eligibility for private services calculated based on gig-work profile
I took loan from [food delivery platform company]. It was on offer within the app which took me to [credit platform app]. They provide loans for delivery boys and amount eligibility was already mentioned when I applied.

Incremental data forming an income history
The [credit platform] works with [food delivery platform company]. I don't have to provide any document other than mobile phone number and fill up the form… For loan payment money is cut from [food delivery platform company] payment to me.

   2.2 Marketing of credit to workers

Gig platform marketing loans as benefits during onboarding
During the first training [at the platform company office] they provided information on how all we can get better income from this job… They said there are loan options available if we get good orders. Both vehicle and personal loans are available for delivery executives.

Personal loans and vehicle loans linked directly to gig-work platforms
Zomato retains the right to share the information provided by you with any financial lending institution(s) if you agree to the same, if it is proved within reason that you have availed a loan from them. You forego the right to claim any damages from Zomato in the event any such financial facility has been availed by you. You also agree that Zomato will not be liable for any damages arising as a result of such disclosure of your information. Zomato retains the right to withhold pending payouts and terminate you on an immediate basis in such cases. (Runnr n.d.)

3. Gig-work as formalisation

   3.1 Data sharing across platforms

Government portal registration under Aadhaar
    Following is required by the worker to register on the eSHRAM portal–
    Aadhaar Number
    Mobile number, Aadhaar linked
    Bank account

Note – If a worker does not have Aadhaar linked mobile number, he/ she can visit nearest CSC's and register through Biometric authentication. (eShram n.d. 1)

Portability tracking for workers moving across platforms
Objectives of eSHRAM Portal: Creation of a centralized database of all unorganized workers (UWs) including Construction Workers, Migrant Workers, Gig and Platform workers, Street Vendors, Domestic Workers, Agriculture Workers, etc., to be seeded with Aadhaar… Portability of the social security and welfare benefits to the migrant and construction workers. (eShram n.d. 2)

3.2 Gig-workers welfare opportunities

Aadhaar as eligibility criteria for availing governmental welfare
Put yourself in their shoes, and see how you can help them in their daily lives w.r.t. benefits like healthcare, education for their children, savings, etc… Start with getting them to open a bank account to bring them into mainstream economy. Make sure they get an Aadhaar, if they don't have one already. Thorough documentation on identity and address also helps you pass on the trust to your customers. (OnGrid 2016)

Platform and government imposed definition of 'gig-work' productivity for welfare eligibility
Platform workers may work for several aggregators simultaneously, and be engaged as workers for intermittent and irregular periods of time. As it stands, the Draft Rules do not address how the minimum period of 90 days of being engaged as a platform worker is to be calculated — a mandatory eligibility criteria for registration under Rule 50(2)(d). It also does not outline how the number of days worked impacts the nature and extent of social protection that platform workers are eligible for. (ITforChange 2021)

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