Transparency, exclusion and mediation: how digital and biometric technologies are transforming social protection in Tamil Nadu, India

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Transparency, exclusion and mediation: How digital and biometric
technologies are transforming social protection in Tamil Nadu, India

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Abstract
This paper examines the effects of biometric and digital technologies on social protection for the poor in India. Drawing on ethnographic research from rural Tamil Nadu, the paper presents evidence of how new technologies are experienced by beneficiaries of the Public Distribution System (PDS), and analyses the impacts of technology innovations on transparency, exclusion and mediation. We focus on the implementation of ‘smartcards,’ new digitised and Aadhaar-enabled ration cards, introduced in ration shops across Tamil Nadu in 2017. We first document how digitised smartcards and mobile text messages transform transparency for beneficiaries by introducing new opacities and information gaps. We then demonstrate how a lack of transparency (re)produces forms of exclusion that remain a challenge under the automated PDS. Finally, we highlight how novel forms of kin and non-kin mediation play a mitigating role in accessing PDS, and constitute a vital part of the infrastructure underpinning social welfare delivery.

Keywords
Social protection; smartcards; PDS; digital and biometric technology; Tamil Nadu, India

Introduction
Social protection has emerged as a key driver of development policy at the beginning of the 21st century, appearing in the Sustainable Development Goals and being the focus of attention in numerous international agencies (World Bank, 2012; UNDP, 2016; ILO, 2017). Recently, social protection programmes have become computerised, adopting ICT with a view to enhance public governance processes (Devereux and Vincent, 2010; Masiero and Prakash, 2019). Despite the introduction of digital and biometric technologies in social protection delivery, opacity and a lack of transparency persist, with implications for inclusion and human mediation. This article focuses on digital and biometric technologies introduced to enhance the front-end delivery of India’s key social protection programme, the Public Distribution System (PDS). We explore these themes through an ethnographic analysis of how automation is changing the delivery of PDS at ration shops in rural Tamil Nadu.
India’s investment in social welfare is not new, but in recent decades social protection programmes have expanded significantly and now include the world’s largest employment guarantee programme (MGNREGA), food subsidies, pensions and free school meals, among others (Drèze and Khera, 2017). Furthermore, India is one of the main global actors in the uptake of digital and biometric technologies, with several states having computerised their welfare programmes to increase effectiveness, transparency and accountability, and reduce exclusion (Masiero, 2015a; Bhatia and Bhabha, 2017). This paper is concerned with the effects of technology innovation on transparency, and in particular with the implications of new forms of opacity for inclusion and mediation around PDS delivery - issues of direct relevance to beneficiaries.

Social protection, digital technology and e-governance in India

The package of technologies rolled out across India is known as the JAM trinity: Jan Dhan Yojana or inclusive banking, Aadhaar and mobile technology. Aiming to expand financial inclusion, the government’s flagship Jan Dhan Yojana focuses on providing free bank accounts to the ‘unbanked’ (Iyer, 2015). Aadhaar, India’s National Unique Identification Project, is the biggest biometric identification project worldwide (Rao and Nair, 2019). Launched in 2009, it provides every Indian resident with a 12-digit unique identification number connected to registered biometric data (iris scan and fingerprints). Following the 2016 Aadhaar Bill, welfare delivery has increasingly been based on Aadhaar-enabled identification (Drèze, 2016). Finally, the use of mobile technology for cash payments constitutes the third pillar of the JAM trinity. Together they support India’s e-governance for development and for the delivery of public services to citizens.

Despite past failures of e-governance initiatives and limited transformations in experiences of beneficiaries, the ‘trend of using digital technologies for public-service delivery continues to flourish in India’ (Hundal et al., 2020). While technology rarely offers a straightforward fix to the flaws of implementation (Devereux and Vincent, 2010; Khera, 2017), it is nevertheless widely believed - by policymakers and ICT developers in particular - that technology will improve social welfare delivery (Masiero, 2016; Bhatia and Bhabha, 2017; Singh and Jackson, 2017). Masiero and
Prakash observe that some see technology as a tool to improve programme implementation, while others use a surveillance lens to highlight its perverse effects (2019, pp. 3-4). In this paper, we explore the impacts of technology innovations on beneficiaries, including the change from paper-based ration booklets to digitised smartcards and mobile text messages, and from in-person to online application processes.

Scholarly debate has long focused on corruption in PDS through so-called ‘leakages’ and ‘diversions,’ and addressing corruption has certainly been a core justification for the recent turn to technology (Khera, 2011; Drèze and Khera, 2015). The shift to an Aadhaar-enabled PDS is precisely aimed at eliminating corrupt practices, particularly duplicates and ‘ghost’ beneficiaries (Masiero, 2015a, 2015b; 2016; Sekher et al., 2017; Hundal et al., 2020). Yet, recent studies of computerisation and biometric identification reveal that leakages often remain hard to curb (Khera, 2011; Drèze and Khera, 2017), and that even Aadhaar-enabled authentication has loopholes (Hosein and Whitley, 2019). In this paper, however, the focus is on the less-studied issue of opacity, its outcomes in terms of exclusion and mediation, and the way in which it transforms beneficiaries’ experiences of PDS delivery.

Enhancing transparency is a key driver behind the introduction of technology in social welfare (Garg, 2008). A major policy aim is to make welfare delivery more transparent by replacing paper-based modes of recording with automated processes of registration, authentication and notification. However, technology’s ability to deliver transparency is under heavy scrutiny (Mazzarella, 2006). In her analysis of the ongoing transition from writing to scanning in public food delivery in Delhi, Rao challenged the denigration of writing as a mechanism for truth-making and the simultaneous optimism about technologies as transparency-producing tools (2017, p. 127). In Delhi, the introduction of plastic ration cards alongside biometric verification (finger-prints) at points of sale was complemented by written recordkeeping. Written records helped to prove that shopkeepers did their job, while offering beneficiaries tangible proof that they received their entitlements. In Andhra Pradesh, Chaudhuri similarly reported that ration shopkeepers recorded distributions in informal booklets as a written back-up that enabled beneficiaries to keep track of disbursements (2019, p. 580).
People, Rao concludes, are keen to hold on to paper documents and question e-data because of the ‘hiatus between text on a screen and the on-the-ground experience’ (ibid., p. 135). Such experience continues to be marred by a struggle for adequate transparency and information. Drawing on recent research from Jharkhand, Chaudhuri (2020) further highlights how Aadhaar-enabled technology in welfare delivery produced new opacities and eroded people’s understanding of welfare schemes, while simultaneously removing older ways of negotiating relations of power and access. This left welfare recipients – as well as last mile delivery agents - with a sense of helplessness and vulnerability that emanated from the black box of technology (Chaudhuri, 2020, p. 9). Our research into the use of smartcard technology and text messaging in the reformed PDS in Tamil Nadu similarly unpacks the opacities engendered by new technology, and raises serious questions about digital and biometric technology as transparency-producing tools.

New opacities in turn have implications for the forms of exclusion and the nature of mediation surrounding welfare access. Indeed, addressing inclusion errors is a second main driver for the use of biometric technology in PDS delivery, with researchers and policy-makers alike seeking to improve access to social protection while removing those without entitlement (Masiero, 2019; Masiero and Prakash, 2015)? Evidence to date is highly mixed, with exclusion from welfare despite legal entitlements constituting a persistent challenge to policy implementation (Muralidharan et al., 2020; Drèze and Khera, 2017). In a study of PDS digitalization in Kerala, Masiero concluded that ‘the biometric PDS is designed to prevent the inclusion error, but no mechanism has been put into place for the opposite problem’ (2019, p. 166), that is, the exclusion of those with genuine entitlement. Moreover, unintended and unanticipated forms of exclusion continue to trouble biometric and digital reforms, not just during transitional periods but more systemically too (Masiero, 2019; Hundal et al., 2020). Much is due to the technology itself, with fingerprint authentication errors, for example, remaining a recurrent obstacle to access. Furthermore, a recent study of the use of biometric identification in the state of Jharkhand revealed that the benefits of reduced corruption were offset by enhanced exclusion rates due to failed Aadhaar linking and authentication processes (Muralidharan et al., 2020). Singh and Jackson (2017) therefore see inclusion as an ongoing process negotiated at the seams where technology innovations interact with
pre-existing infrastructures and relationships. We build on this focus and present further evidence of persistent exclusion issues due to technology integration. In particular, we examine how the rural poor are affected by technology innovations that prioritise inclusion errors over the exclusion of entitled beneficiaries.

Finally, the (re)production of opacity impacts the nature of mediation in welfare delivery. As Hundal and colleagues observe, the push towards computerisation of PDS emerged from a desire to minimise human intervention and remove the scope for widely vilified human manipulation (2020, p. 2). Technology is seen as the ultimate enabler of direct and unmediated exchange between citizen and state (Chaudhuri, 2019; Masiero, 2016). Or, as Mazzarella put it, e-governance is the contemporary avatar of a more generalised desire for a ‘politics of immediation’ (2006, p. 476). Empirical studies, however, indicate that biometric and digital technology continue to require human mediation and intervention at different levels. Hundal et al, for example, emphasised the mediating role of ration shopkeepers and argued that disbursements at shops continue to be skewed by social relations of caste, class and gender (2020, p. 5). Others have recognised human mediation as central to the very functioning of technology itself pointing out that when biometric authentication fails, ration shopkeepers adjust the system (Chaudhuri, 2019) or revert to paper-based recording (Rao, 2017) to enable disbursements. Such findings reveal that despite the deep-seated suspicion of human intervention, technology in fact relies on creative human improvisation – including fixing, adapting and rule breaking - to make it work (Rao and Nair, 2019, p. 418).

We therefore draw on Simone’s concept of ‘people as infrastructure’ to show how everyday human practices and interactions are an integral part of the infrastructure that makes technology work (Simone 2004). Or, put differently, the functionalities of technology are materialised not just through physical and technical processes but as much by virtue of creative human mediation. Chaudhuri, in her study of ration shopkeepers and e-kiosk operators, similarly urges us to frame technology ‘as situated practice’ and to focus on how human actors ‘enact technologies … through their everyday work practices’ (2019, p. 577). In what follows, we contribute to debates about the changing nature of mediation around PDS through a focus on forms of kin-based mediation that enable access to smartcards, rations, and proof of
purchase. We argue that while family-based forms of mediation tend to remain invisible, they are vital to how vulnerable social groups experience PDS delivery and to how transparency is produced. We explore the age and gender dimensions of kin mediation and dependency, and show that e-governance innovations tend to reproduce a focus on the family rather than the individual in welfare delivery, thereby missing an opportunity to empower women in their own right and reduce their dependency on men and kin (Sriraman, 2018). We also explore non-kin mediation through a discussion of internet centres, which facilitate online applications for those who lack digital literacy or tools (Chaudhuri, 2019; Gelb et al., 2018) and remove bureaucratic processes from localised relations of power, caste and class. Unfortunately, online processes often require complementary in-person and paper-based applications at government offices, thereby perpetuating the need for human intervention.

Human mediation is indispensable to the processes of applying, registration and classification that precede technology-mediated welfare delivery. Baxi (2019) underscored the vital role played by intermediary civil society organisations in registering vulnerable and undocumented groups under Aadhaar in north India. Moreover, human decision-making permeates processes of classification that determine eligibility. A household’s classification as above or below poverty line (APL/BPL), for example, remains based on human decision-making. Indeed, biometric identification does not in itself convey entitlement or determine eligibility, nor does it eliminate the need for citizens to apply for a ration card or BPL status (Bhatia and Bhabha, 2017). As we have already shown, application and registration processes require in-person visits to government offices, dealings with bureaucracy, and leaning on patrons, networks and brokers (Carswell et al., 2021). Rao’s study of Aadhaar registration among Delhi’s homeless similarly revealed that UID becomes ‘enmeshed with, supplements, and completes older forms of authorisation through documents and personal recommendations’ (2013, p. 76). The paper-tiger that is the Indian state rarely retreats in the face of novel technologies (Mathur, 2016). Rather, it is at the seams of overlapping layers of infrastructure that opacities emerge, leading to persistent forms of exclusion and an ongoing need for human mediation (Chaudhuri, 2020; Singh and Jackson, 2017). As such, a host of human and paper-based interventions continue to shape access and entitlement to welfare, and in
what follows we show how registration for new smartcards in Tamil Nadu and classification under new priority/non-priority household (PHH/NPHH) categories remain highly mediated and, hence, ambivalent processes.

**Setting the scene: field sites and research methodology**

The evidence presented here draws on fieldwork in western Tamil Nadu, in two villages – called Allapuram and Mannapalayam – located in the hinterland of Tiruppur. Located within 20km of the Tiruppur textile hub, the villages have very different linkages and connections to the city. The authors have conducted field research here since 2008, on a range of topics including changing livelihood strategies (Carswell and De Neve, 2014a), MGNREGA (Carswell and De Neve, 2014b), voting and elections (Carswell and De Neve, 2014c), and labour bondage and indebtedness (Carswell et al., 2021). The background to this paper is thus a longer-term understanding of different aspects of villagers' lives, and their multiple interactions with the state (Carswell et al., 2019).

The material presented here is based mainly on research conducted in November 2017 and July and September 2019 that included a range of qualitative methods, including in-depth interviews with over 50 informants. As well as visits to people’s homes and work places, observations were conducted in four ration shops and several internet centres in nearby towns. The interviews sought to gather people’s own narratives of their engagement with the reformed PDS and with the materiality of bureaucracy. We also explored villagers’ experiences of technology transformations around welfare schemes, and their opinions of the recent innovations that were affecting their access to the PDS in particular. The responses received and experiences observed allowed us to identify the lack of transparency engendered by technology, opacity’s exclusionary effects on entitled beneficiaries, and the forms of mediation required to restore access and gain clarity.

**Technology and PDS in Tamil Nadu**

The PDS began in the 1940s, providing food commodities such as rice and wheat to eligible households. Tamil Nadu is the only state in India with a universal rather than
targeted PDS, but levels of entitlement are determined by a household’s categorisation as ‘below poverty line’ (BPL), ‘above poverty line’ (APL) or AAY (Antyodaya Anna Yojana; the ‘poorest of the poor’). Digital and biometric technology reforms for PDS in Tamil Nadu were closely linked to the introduction of the UID (Aadhaar) and the passing of the National Food Security Act (NFSA) in 2013. Despite an initial refusal to implement the NFSA due to potential financial losses (The Hindu, 2016), Tamil Nadu started to implement the NFSA and identify ‘priority households’ (PHHs) that would receive additional benefits. Households classified as PHH are supposed to include all BPL households, as well as households headed by women or differently-abled persons and households of agricultural labourers. Those excluded from PHH status are households with an income tax payer, more than five acres of land, an annual income of Rs 100,000, and those who own a car or air-conditioner (The Hindu, 2016). The process of identifying PHHs inevitably raised concerns and reports soon emerged in the media of BPL households not being allocated PHH status (The Hindu, 2017).

Alongside these debates about the categorisation of households into PHH or NPHH, the state government introduced new technology to reform PDS delivery. In early April 2017, the state’s Chief Minister K. Palaniswami launched a smartcard scheme, with the ambitious aim of replacing 18.9 million ration booklets by the end of May that year (The Economic Times, 2017). The Chief Minister praised the multiple benefits of smartcards and digitised ration shops, including the elimination of fake cards and duplication, distribution to the deserving and the ability to apply and make changes online (Ibid.). Just a few weeks later, in the middle of May 2017, the roll-out of smartcards was in full swing across the state. By the time of our field research in November 2017, most, but definitely not all, households in our study villages had received an Aadhaar-linked smartcard. The automation of the ration shops and the use of smartcards for ration distribution was advancing rapidly, but as we detail below, it was far from complete or problem-free.

Automating and digitising ration shops in Tamil Nadu
All four ration shops that we visited in November 2017 had been equipped with a scanning machine that reads the smartcard and indicates a household’s monthly food entitlements. Thus, in both our study villages and neighbouring localities, the transfer to smartcards was largely complete, although there was variation in how these were used for distributing rations. In two of the ration shops almost everyone had a smartcard and they were being used routinely. In the third, most but not all smartcards had been distributed and even those villagers who had not yet received their cards had had their details entered into the online system. In the fourth ration shop, the smartcards had been distributed and used, but the scanning machine had broken so the old paper booklets were being used until a replacement machine could be provided.

How, then, was the automation of ration shops and the issuing of digital smartcards affecting ordinary villagers’ access to rations? The process of getting rations from the shop remained broadly unchanged. The ration shop is located in the village centre, with its opening hours painted on its outer walls. When the shop opens, a queue quickly forms outside. In the past, people brought their ration booklet to the shop window and the shopkeeper wrote the details of rations collected in the booklet, took payment, and gave the purchaser a chit of their purchases. The recipient then walked around to the door of the shop, handed the chit to an assistant who disbursed their items. Much of this process remains unchanged under the automated system. Now, instead of their booklet, villagers hand over their smartcard. The shopkeeper holds the card over the ‘smartcard reader’, which shows the household’s total monthly allocation and their remaining balance on a screen. Payment is made, the shopkeeper enters the figures into the card reader, and hands them a chit to take to collect their rations. Crucially, unlike in other parts of India, in Tamil Nadu electronic authentication does not require biometric identification by fingerprint.

While paper booklets are no longer used to record rations and the shopkeeper no longer uses paper, the information about collected rations is now held in the computer. As a form of ‘receipt’, a text message is sent to the recipient’s mobile phone with details of purchased rations. In some cases, the message arrives immediately – indeed, a man standing at the ration shop window showed us the text message that he had received minutes after buying his provisions. The speed at
which messages are delivered, however, depends on the mobile network. Some ration shops have good connectivity and the shopkeeper sends text messages throughout the day. In other places, the shopkeeper sends the messages at the end of the working day or whenever they can get a network connection. In addition, at times there are also ‘network problems’ or issues with the card readers, which delay or prevent the sending of messages.

**Compromised transparency?**

So how does new technology affect beneficiaries in our study villages and what do people make of the government’s promises of enhanced transparency? While the automation and digitisation of sales has brought far reaching organisational transformations for the shopkeeper, for the customer the biggest changes are the introduction of digitised smartcards and the use of text messages as receipt of purchase (Rao, 2017; Sriraman, 2018). When asked what they made of the new card, a group of women bemoaned ‘we were used to [the] writing in the book before and now that doesn’t happen’. Recipients revealed that the switch from an entry in a booklet to a text message – or from paper document to digital message - had a number of significant consequences, related to transparency, proof-making and, ultimately, power (Marathe & Chandra, 2020). Digitisation changed the proof of purchase for recipients, shifted the language of communication, and enhanced reliance on mobile phone technology. Each of these shifts significantly reduced the transparency of welfare delivery, and consequently the negotiating power of beneficiaries vis-à-vis ration shopkeepers. Let us consider each of them in turn, and challenge assumptions that digital technology produces unqualified and linear improvements in transparency.

Informants unanimously preferred written notes in their paper ration booklets as a clearer proof of purchase than text messages. The old ration booklets were documents that women never let out of their sight and that offered them a degree of power, especially the power of proof of purchase. While many women found it hard to keep track of text messages, this was particularly challenging for older villagers less comfortable with mobile technology. A younger woman, Maalini, explained that
she preferred the booklet because it allowed her to verify anytime what she had bought by simply looking in her booklet. She also said that the texts were not reliable - sometimes messages reached them immediately, while on other occasions they arrived hours or days later, or even not at all. As a result, they were widely mistrusted and ignored.

Maalini explained that she herself is a forgetful person, and that she once went to the ration shop to buy food items, only to be told that she had already bought those goods some days earlier. At the time she could not remember what had happened and so returned home. Later, however, she remembered that she had gone to the shop with a friend, but that the service was down that day and that they had been told to come back another day. As such, she had not received the provisions, but as she had not received a text message either, she lacked proof that she had not bought anything yet that month. Whilst previously the absence of an entry in a booklet could be used as proof of not having bought rations, the lack of a text message is not taken as proof of not having bought goods. Instead, Maalini explained, if one complains to the ration shopkeeper, one will simply be told that the message was not sent properly because of some network problems. Thus, the absence or presence of a text message does not help one make the same argument as an entry in a physical booklet. Unlike in other places where informal written documents are maintained (Chaudhuri, 2019; Rao, 2013), here villagers lacked a paper record of rations received, which in turn disempowered them in negotiations with shopkeepers.

A second issue, widely complained about by our informants, was that the text messages about their purchases were in English. As a result, many women and the elderly who cannot read English have to find someone to translate the message to crosscheck their purchases. A woman in Mannapalayam, when asked about how they felt about these messages, exclaimed: ‘They are in English! They are in English – so I don’t read it and I delete it immediately!’ Others usually show a relative or neighbour who can read some English and ask for help to crosscheck the message against their purchases. For those illiterate in English access to information about their purchases thus requires a new form of mediation, and potentially a new dependency on others, to materialise the transparency that text messages are supposed to deliver (see below).
Limited ownership of mobile phones amongst some sections of the rural population further impeded transparent flows of information. Particularly noteworthy is the considerable gender and age-gap, with women and older people less likely to own mobile phones while being responsible for collecting rations (see Chaudhuri, 2020). Instead, the smartcard of many women is linked to a relative’s phone number, typically that of a husband, father, father-in-law, son or daughter-in-law. This enhances the opacity of the process as text notifications are sent to those phones, adding a further layer of kin-based communication and mediation to women’s ability to obtain proof of purchase. The resulting complexity should not be underestimated. Take the case of Palaniammal, a woman in her sixties in Allapuram, without a mobile phone. She had used her son’s phone number to receive notifications about the payment of her NREGA wages into her bank account. But when it came to the ration smartcard, her son had already registered his mobile number for his own smartcard, and two smartcards cannot be linked to the same mobile number. She therefore had to use her daughter-in-law’s phone to receive the messages regarding her rations, which meant she actually never checked them.

Clearly, limited mobile phone ownership increases the dependency of women and the elderly on kin members, and introduces new forms of kin mediation needed to access proof of collected rations or received NREGA wages.iii Highly differentiated phone ownership among the rural population continues to seriously impede technology’s ability to deliver information and transparency to beneficiaries. The latter have to rely on kin for information about welfare delivery and proof of purchase. While poorer and lower-caste villagers are already disadvantaged with regards to language and mobile phone ownership, they also lack the social clout to claim entitlements. Wealthier members of the higher-status Gounder caste, for example, are very differently placed. For them an error in a text message or ration delivery can usually be quickly resolved. A Gounder in Mannapalayam recounted having received an erroneous message and so walked straight to the ration shop and shouted at the woman shopkeeper demanding she resolved the problem.

The assumption that digital technologies enhance transparency and immediacy is thus not borne out by ordinary welfare recipients’ everyday experiences of technological innovations. The vilification of corruptible handwritten documents similarly becomes less convincing against the new opacities introduced and the
novel forms of kin mediation required by digital technology. Commenting on the early promises of e-governance, Mazzarella noted that its ‘attraction was rooted in a naive notion of the inherent incorruptibility of digitized information’ (2006, p. 477). From the start, e-governance, computerisation and digitisation aimed to introduce a transparency and immediacy between state and citizen that never existed before. Or, as Rao put it, e-governance intends to deploy ‘computer technology to rescue official communication from the messiness of writing and the dangers of forgery. … Computer technology is said to trump writing on a scale of objectivity, because mediation is achieved not by human intervention, but by seemingly neutral machines not easily manipulated’ (2017, p. 133).

Transparency and immediacy are ultimately about power and technology aims to shift power away from bureaucrats towards beneficiaries. In a discussion of a major e-governance project, Marathe and Chandra demonstrated that ‘the move from paper to electronic systems entails a loss in power for bureaucrats, and that this disempowerment helps ensure that paper remains abundant’ within the bureaucracy (2020, p. 8). What applies to bureaucrats unsurprisingly holds for ordinary welfare beneficiaries too. The removal of the paper booklet clearly took away a physical proof of purchase and thereby weakened villagers’ ability to argue their case and claim basic food rations. The evidence presented here points to the introduction of new opacities around what makes for evidence and proof, new forms of exclusion around language and phone ownership, and novel channels of mediation by kin required to access information and make it legible. While a lack of transparency disempowers beneficiaries vis-à-vis an ever more distant and opaque state (Chaudhuri, 2020), those already marginalised as well as women are particularly impacted by PDS reform. By intensifying women’s dependence on kin, e-governance reproduces a focus on the family rather than the individual in welfare delivery, and strengthens – rather than weakens - patriarchal relationships by enhancing women’s reliance on men around welfare access.

_Persisting exclusion errors?_

Opacity and exclusion are thus closely connected. Persistent exclusion from state welfare and citizen rights is one of the most dire realities for those already
disenfranchised. One of the stated policy aims of issuing Aadhaar-linked digitised ration cards is precisely to address errors of exclusion and inclusion (Masiero, 2019; Jacobsen and Rao, 2018; Rao, 2017). In practice, however, exclusion errors remain a major challenge to social protection policy implementation across India (Masiero and Prakash, 2015; Drèze and Khera, 2017). Khera, for example, has shown that UID cannot in itself avoid the misclassification of people and their entitlements (Khera, 2011), as other processes of classification precede technology-enabled delivery. Sriraman emphasised the multiple paper-based verification and identification processes - involving for example proof of address and caste certificates - that underpinned Aadhaar enrolment among migrants in Delhi (2018, p. 217). Rao similarly highlighted the additional bodily processes of verification – iris scans, finger prints, and so forth - that now supplement paper-based regimes of identification (Rao, 2017). Access to Aadhaar-enabled PDS in Tamil Nadu is reliant on similar additional processes of classification and registration that are external to – and precede – new technologies. As such, it is at the seams of new systems of technology and existing systems of classification that a lack of clarity, exclusion, and ongoing negotiations over how to address them are (re)produced (Singh and Jackson, 2017)

In Tamil Nadu the categories of PHH and NPHH are particularly important with respect to exclusion. While the state government has consistently denied plans to move away from universal coverage, were this to change, the categorisations of N/PHH would become highly significant. Although these categories were printed on everyone’s smartcard, none of our informants knew their relevance, how they had been classified as PHH or NPHH, or where to go to make alterations. We were told by a ration shopkeeper that it was the VAO (Village Administrative Officer) who drew up the list of PHH and NPHH households based on existing BPL and APL classifications, while another shopkeeper shared that she had been told that these categories would become important in future with NPHH holders getting reduced rations. What is clear, however, is that inclusion in the PHH category depends on prior forms of classification as well as on new decisions about eligibility that remain outside the realm of technology. Such processes of classification remain veiled in systemic opacity and, as a result, produce exclusions that are often challenging to resolve.
Who then gets excluded, and how? Many exclusions related to the initial application process for digitised smartcards (Hundal and Chaudhuri, 2020). We found that those commonly excluded from access to smartcards, and hence PDS, were couples who had a ‘love marriage’ and had fallen out with their families in the process. To get a ration card when establishing a household, one has to first be removed from one’s existing card, usually that of one’s parents. However, parents angry with their son or daughter’s self-arranged marriage, often refuse to remove their child’s name from the family’s card, thus preventing their child from applying for a card in their own name. Kin mediation – here in the form of kin approval or collaboration - is key to one’s ability to obtain a new ration card.

Karpagam, who we first met in 2015, is a typical example of how kin relations shape people’s ability to claim state resources. A woman in her late 40s, with three children, Karpagam had a love marriage that was opposed by parents on both sides. In the 25 years since her marriage she tried repeatedly, but unsuccessfully, to get a ration card. Each time she was asked to provide evidence that she had been removed from her parents’ card, which she was unable to present. For Karpagam lacking a ration card did not just mean being deprived of rations, but being unable to get a bank account, apply for state-provided medical insurance, or obtain a community certificate. The effects were felt into the next generation as her recently married daughter was equally unable to get a ration card of her own. When we interviewed her, Karpagam was concerned that her younger daughter, who was doing well at school, would be unable to apply for a scholarship without a card. She noted ‘when it comes to school and medical issues I feel handicapped because the card is not there…. For anything you touch you need to have a ration card’. She continued, laughingly, that if she died tomorrow, she didn’t even know if they would bury her without a card!

While this exclusion was not new per se, the transition to smartcards had done little to alleviate her concerns. Returning to Karpagam in 2017, we found her still without a ration card. When the new smartcards were being distributed, Karpagam’s son, Kanaan, again tried repeatedly to get the household a card, but on each occasion their application was rejected, leaving them convinced that unless they could provide proof that Karpagam had been removed from her parents’ card, it would be impossible to ever be issued their own card. At the time that we spoke to Karpagam
in November 2017, she and her son only knew about applying through government offices and were unaware you could apply for smartcards online or at internet centres. It was only through us that they learnt about the possibility of applying online, and below we describe how they ultimately managed to obtain a smartcard this way. Others, such as those orphaned when young, similarly struggled to obtain a ration card. A woman from Mannapalayam in her early 50s, for example, had lost her parents at a young age and had never been on any ration card. Despite many efforts, she had never managed to get a card in her own name. When smartcards began to be distributed, she had been advised to apply for one, but as of late 2017 had not managed to obtain it.

Another frequently encountered exclusion error relates to households having a smartcard, but with one or more family members missing from it. Often, this involved young children without an Aadhaar number, but other cases were clearly more complicated and harder to resolve, often leaving households for months without their entitlements. Take the case of Rachita from Allapuram, who received her new smartcard in the autumn of 2017. While her old ration card listed herself, her husband and her son, when they received their new smartcard, it only contained the name of her husband. This had surprised Rachita given that they had submitted all their Aadhaar numbers to be linked to the new smartcard. Attempts by the ration shopkeeper to rectify the mistake were unsuccessful. Not only are mistakes made during the ‘seeding’ of data, but subsequent interventions cannot necessarily rectify the errors.

Other villagers reported being without a card altogether. Vaanika, for example, used to have a ration card naming her, her husband and two children. She applied for a smartcard, but it never reached her. Meanwhile their old ration card was blocked and Vaanika had been without provisions for four months, with no obvious resolution in sight. Some such exclusion errors are referred to as ‘seeding errors,’ that is, errors that occur during the linking of Aadhaar numbers with PDS smartcards or NREGA job cards (Khera, 2017). Similar issues in the linking of Aadhaar to PDS have been reported in Jharkhand, Andhra Pradesh and Karnataka too (Chaudhuri, 2020; Hundal & Chaudhuri, 2020). Such errors are often labelled by policy makers and bureaucrats as mere teething problems to be expected with the implementation of new technology, and therefore be dismissed as ‘temporary’ and largely ‘technical’
in nature. But our data suggest that they are not uncommon, frequently take considerable amounts of time and effort to rectify, and either create new exclusions and uncertainties in the process or reproduce older ones, with PDS recipients being left in the dark about why the error occurred or how to resolve it. It is precisely this lack of transparency about the process that often leaves problems unresolved for months or even years. This not only makes it inadequate to label these issues mere teething problems, but such labelling also erases the human interventions of re-applying, providing documentation and endless waiting that typically ensue (Carswell et al., 2019).

Reconfigured processes of mediation?

Opacity leads to forms of exclusion and uncertainty that our informants then sought to mitigate through various channels of mediation. Scholars have unpacked the nature of the ‘mediated state’ in India, and indicated that the introduction of digital technology has not removed the need for mediation by a range of patrons, political actors and civil society organisations (Webb, 2012; Rao, 2013; Baxi, 2019; Chaudhuri, 2019). One change alongside the introduction of technology is that new, private sector actors and online application processes have come to complement - and at times replace - face-to-face engagement with officials. Across India, a range of private organisations – from NGOs to internet centres – have been licensed to issue Aadhaar cards and, more recently, smartcards too (Baxi, 2019; Chaudhuri, 2019; Chambers, 2020). As application processes have gone online, people can bypass government offices and in-person applications by either applying online themselves or by going through internet centres. People can also make changes and corrections to existing cards online, such as changing an address or adding a household member. However, what we encountered in the village was anything but a level playing field. The reality took the form of a highly differentiated terrain shaped by class, caste, age and levels of education. While wealthier villagers with a home computer and internet connection or with a smart phone went online to make applications or amendments themselves, the rural poor had to rely on internet centres in nearby towns – if they knew about these processes in the first place.
Nevertheless, these private actors have begun to play a new mediating role, with the potential to transform citizens’ relationships with the welfare state.

Who, then, are these new actors? While NGOs played a role in the distribution of Aadhaar across India, in Tiruppur, internet centres were also involved in smartcard distribution (Chambers, 2020). WebCity is one such centre that received a license to issue Aadhaar cards and smartcards and now runs six e-kiosks across Tiruppur. They assist people with online applications as well as amendments to smartcards, such as corrections to addresses and misspelt names. We observed how this works in one such centre and witnessed a fast and efficient process. Aadhaar numbers were checked and information fed into the computer, which was then forwarded to the taluk office for approval. The centre’s staff told us that the process is straightforward and applications are normally approved within a month. By late 2017, the centre staff had clearly built up a good deal of knowledge about application processes, and were able to advise customers on application processes and supporting documents.

In late November 2017, we had the opportunity to observe an application for a smartcard at this internet centre from start to finish. When we told Karpagam about the possibility of applying for a smartcard at an e-kiosk, she immediately arranged to come to Tiruppur and asked us to accompany her. On arriving at WebCity, we were assisted by Vinod, the young man running the centre, who asked Karpagam and her son Kanaan for the required documents, including their Aadhaar cards and gas cylinder document. They were advised by Vinod not to include Karpagam’s oldest daughter on the application, as she was already married and living at a different address. Vinod thought including her might cause the application to be rejected. He took photographs of the three Aadhaar cards (Karpagam, Kanaan and Poornima, her unmarried daughter) and of a passport photo of Karpagam as head of the household, and uploaded these onto the TNPDS website. Then he entered their names, address and gas cylinder number, and was immediately able to confirm that none of their three Aadhaar cards were linked to any other smartcard. He then explained the next steps to Karpagam and Kanaan: first, the documents would be verified, then the taluk office would approve it, and finally the TNPDS would send the card to their ration shop.
The whole application process took no more than 20 minutes and was very straightforward. Unlike application processes at government offices, this online application involved no queuing, no disrespect and no being told to come back another day with more documents. It did require a payment of Rs 500. In many ways, what Karpagam went through was the very opposite of what ordinary people experience when encountering state bureaucracy: processes of waiting and queuing, being sent back and forth, being made to wait and beg, and having to rely on the goodwill of patrons or the payment of brokers (Hull, 2012; Carswell et al., 2019). By contrast, at the internet centre, mediation was removed from the social networks of power, caste and class that typically mark villagers’ engagement with local state officials and rural intermediaries. It was replaced with a more contractual and impersonal interaction in exchange for a standard fee. Karpagam and Kanaan were given a printout of the submission and a reference number to check the status of the application online. Back in the UK, we regularly tracked the application online, using Karpagam’s reference number. For several weeks nothing changed, until on 30th January 2018, just over two months since the time of application, it appeared online as approved.

Meanwhile, Kanaan had also been monitoring the status of the application online by going to the internet centre. Karpagam finally received a text message that her smartcard was available for collection at her local ration shop. On receipt, she discovered she had been issued a ‘sugar card’ (NPHH), which gives her considerably fewer rations than a ‘rice card’ (PHH). But she was still utterly delighted to have a ration card for the first time in her life. She was told that she would need to apply through the taluk office to convert her sugar card into a rice card as this could not be done online. Importantly, therefore, despite the new online opportunities, digitised bureaucratic processes still require supplementary in-person and paper-based processes. In particular, the crucial process of classification of households into PHH/NPHH continues to require an in-person application at the taluk office. Karpagam continued to make visits to the taluk office throughout 2018 and 2019 to try to change her status, but without success. It was not until a government camp was organised in November 2019 – following a policy decision - that she successfully had her status changed to PHH.
A lack of clarity permeated the entire process. It was never clear why Karpagam was successful applying for a smartcard through the internet centre, while previous applications through the taluk office had been turned down repeatedly. Kanaan had always applied for the same household members, using the same documents as proof. But what surprised them – and us – was the ease with which this process could be completed online, and the straightforward help offered by the internet centre for a fee of Rs 500. It required no mediation by either government officials or political brokers. But when we first spoke to Karpagam in 2017, neither she nor her son were aware of this online process, nor did many others in the village know about this. We ourselves came to know about the online application process put in place by the state government by talking to Kadhir, the well-educated son of a wealthy Gounder in Mannapalayam. Kadhir, who works in a Tiruppur garment company, and owned a smart phone and a computer, explained that he had had to make some changes to his father’s smartcard and a friend had told him about a YouTube video that explained how to do this online. He had followed the instructions and successfully removed his newly-married sister and added his own name to his household’s smartcard. He showed us on his phone how to complete the process, and when Kadhir recounted this to us, we realised the potential of such online processes to bypass government offices and in-person processes.

While most villagers were unaware of the digital opportunities enabled by recent policy changes, some began to appreciate the new channels that enabled bureaucratic access. Take the case of Joy who in 2015 was recently separated from her husband and had returned to live with her parents. She had been removed from her parents’ card on marriage, and found herself unable to get a ration card in her own name. Joy made endless trips to the taluk office to try and get a card being fully aware of its importance:

‘[it is] very important (rumba mukiyam) … without that your existence is wasted [English word ‘waste’ used] in the village and in the state. Wherever you go, they ask for the card. Even to get a duplicate birth certificate you have to show the ration card.’
Two years later, in November 2017, things were looking up: remarried to a man with a steady job as a bus driver Joy had managed to secure a smartcard in her own name. Showing us the back of the smartcard, she pointed at the government website where one can add people to the card, explaining she would use this to add her young daughters. We were somewhat surprised by her awareness of the online process, but having dealt extensively with government processes before, Joy had built up a considerable amount of bureaucratic knowledge.

While the better educated and connected villagers – digitally and otherwise – like Kadhir were clearly the first to gain awareness about new online processes, many others remained largely unaware of the new opportunities offered by digital technology. Most villagers rely on word-of-mouth information and on those who already mediate their relationship with the state. Meena is one of them. As the banking correspondent for Mannapalayam, she is generally well informed about technological innovations and familiar with the bank card reader device that she uses in her job. She visits the village daily and uses a mobile cash device to accept deposits and pay out pensions and NREGA wages. Villagers turn to Meena with an array of questions ranging from pension payments to smartcard applications. Mediators, like Meena, gradually spread information about new, online application processes and about the more direct ways in which ordinary villagers can obtain cards and certificates, and bypass bureaucrats and officials.

**Conclusion**

In 2017, Tamil Nadu, like other states across India, enacted substantive changes to PDS delivery. Digital and biometric technology innovations transform how ration shops are run and citizens access their entitlements. While our findings are necessarily constrained by the limitations of our ethnographic research, they nevertheless enable us to question overly optimistic assessments of digital and biometric innovations. In conclusion, we summarise how they transform beneficiaries’ experiences of PDS delivery, and draw some lessons for the future design of digital and biometric technology for social protection.

First, despite the search for transparency, digital and mobile technologies reproduce – and even enhance – opacities and information gaps. The replacement of a written
record with a text message as proof of ration purchases is perhaps the most significant change for beneficiaries. Such text messages leave recipients substantially disempowered vis-à-vis state representatives. This echoes Rao’s conclusions from Delhi that people often hold on to paper documents ‘as media with a high reality effect’ (Rao, 2017, p. 134) that provide material proof in hand. Moreover, transparency is not only compromised by the new technology, it is also increasingly dependent on kin mediation for its materialisation. At the same time, mass collection of digitised data makes beneficiary profiles transparent to the state, hence widening the imbalance in data justice between citizen and state.

Secondly, our findings demonstrate how technology reforms and the opacity that surrounds them reproduce the exclusion of entitled beneficiaries at ‘the seams of multiple interconnected systems’ of registration and classification (Singh & Jackson 2017: 1). The seeding of Aadhaar data to new smartcards has been anything but smooth. Some errors have left people without entitlements for months and without information about how to resolve the issue. In many ways, the forms of exclusion around enrolment in the Aadhaar-enabled PDS reflected those previously reported for Aadhaar enrolment itself (Rao, 2013, 2017; Sriraman, 2018). Moreover, the use of mobile phones and English as new means of communication produced novel forms of exclusion, disproportionally affecting the poorest, those lacking mobile technology and those digitally less literate. As such, a persistent policy focus on erroneous inclusion (duplication and ghost beneficiaries) and corruption (leakages and diversions) rather than on problems of exclusion risks prioritising state interests over the needs of welfare recipients (Masiero, 2019). Our evidence clearly suggests that PDS digitisation has failed to prioritise exclusion problems over inclusion errors. This points to the need for a shift in policy priorities in the design and implementation of technology for welfare reform. Reforms should aim to ensure that new ‘systems are designed to gracefully integrate into and retire out of existing ecosystems’ (Marathe & Chandra, 2020: 2), so that the needs of the most vulnerable are not neglected in the process.

Thirdly, our findings provide new insights into the forms of mediation that seek to mitigate the effects of opacity and exclusion. As Chaudhuri writes, ‘human intermediation in technological infrastructure is … invisible yet inevitable’ (2019, p. 572). Indeed, human mediation is part of the very infrastructure that makes
technology work. Mediation by kin transpires as crucial to the delivery of a reformed PDS as it facilitates access to smartcards, mobile phones, and text messages about disbursements. While some kin dependencies already existed, others were created in the process of replacing paper-based proof of purchase with mobile phone messaging. Our ethnographic evidence reveals that women and the elderly remain particularly vulnerable in this respect, as well as those living non-normative lives, as in the case of a love marriage.

The effects of technological innovation on welfare delivery can therefore not be understood outside a careful analysis of how household relations and kin interdependencies shape people’s access to, and engagement with, social protection. In particular, technology’s impacts need to be situated against the state’s enduring normative assumptions about the household, male headship and patriarchy that resurface at the intersections of technology, identification and welfare delivery. The fact that NREGA entitlements and PDS smartcards remain issued through the household rather than the individual supports Sriraman’s point that citizenship is often produced through ‘a social order that reinforces a heavily disciplined family norm rather than a minutely managed individual identity’ (2018, p. xxxviii). Indeed, the household remains the bedrock of classification, verification and welfare delivery, subsuming individual rights within household entitlements and making individuals dependent on the mediation of kin to materialise their entitlements as welfare recipients. Innovative technologies, such as a digitised PDS, have done little to empower women in their own right or to reduce their dependency on men and other kin members (Gelb et al., 2018; Sriraman, 2018). Rather, they tend to reproduce an explicitly patriarchal view of the household and its entitlements.

In terms of non-kin mediation, our evidence suggests that online applications via the TNPDS website offer novel opportunities for ordinary citizens to benefit from direct and automated approval processes, yet in the process new intermediaries resurface, such as urban internet centres (Chambers, 2020; Chaudhuri, 2019). Moreover, online processes routinely need complementary in-person applications at government offices as well as the submission of paper-based documentation to determine eligibility and entitlement. Indeed, the vital process of classifying households into PHH/NPHH remains firmly located within the sphere of human decision-making. While the state pursues increasingly disintermediated citizen–state
relations through technological innovation, effective implementation of such technology continues to rely on human mediation around classification and registration (Baxi, 2019, p. 16). Such mediations constitute the vital human infrastructure that makes systems – old and new - work for the poor and that helps to materialise technology’s promised benefits (Chaudhuri, 2019, p. 576). Our findings underscore the significance of kin and non-kin mediations to beneficiaries’ engagements with the reformed PDS and highlights the ongoing role of human decision-making around classification, eligibility and access, which remains outside the realm of technology.

References


