Working Digital Money into a Cash Economy: The Collaborative Work of Loan Payment*

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Abstract. This paper examines how different forms of money, specifically digital versus cash, impact on the work of an organisation and its customers. In doing so it contributes to the body of literature exploring the relationship between the social meanings of money and practice. We conducted an ethnographic study of loan collections; specifically, the workflows whereby a social enterprise intermediary managed the loans given to auto-rickshaw drivers to purchase their auto-rickshaws. Drivers made payments in cash or through mobile money. We found that making the mobile money service usable for the drivers took considerable work. It is tempting to take a transactional approach to payments, and indeed we initially approached the problem of enabling frequent payments as one of payment mechanism. However, in practice, payments take place within sets of social relations and, in this case, usability was achieved because the mobile payment system was embedded in a wider, trusted, loan payment ecosystem. It takes considerable collaborative work, and a fair amount of flexibility, to enable these financially vulnerable drivers to pay off their loans, and reducing the issue to one of payment mechanism alone does not tell the full story.

1   Introduction

The digitization of money is an ongoing phenomenon, with most economies operating with some mix of cash and digital. Studies have examined the different forms that money takes, from cards (Pritchard, Vines and Olivier, 2015; Mainwaring, March and Maurer, 2008), to mobile phone based digital wallets (Hughes and Lonie, 2007), cash (Kumar, Martin and O'Neill, 2011), and cheques

(Vines, Dunphy and Monk, 2014). Each representation has its own affordances which influence its adoption and impact on the wider socio-interactional setting in which it is being used. Where money is part of a work setting, its different manifestations can have considerable consequences for the workflow. This paper contributes to the growing body of research which examines how different forms of money, most often digital versus cash, impact on the work of organisations and their customers. For example, Pritchard, Vines and Olivier, (2015) described how the move from cash to digital-only payment on London buses impacted both drivers and passengers; Ferreira, Perry and Subramanian (2015) examined how Bristol pound payments played out in the workflow of small local merchants; and Blumenstock et al (2015) described a randomized control trial which showed that digital salary payments proved more beneficial to employers than employees.

Digital money is common in the Global North, and with many more affluent populations in the Global South. However, with some notable exceptions, there has been little penetration into low income sectors in the Global South. Mobile money, that is, money handled through mobile phones, is being widely promoted in the development sector. It promises safe, easy, anytime, anywhere payments, and many hope it will lead to financial inclusion (see for example, Scharwatt et al, 2014, Pickens, Porteous, and Rotman, 2009). For organisations, removing the costs and risks associated with handling cash can offer real benefits (Blumenstock et al, 2015), making mobile money a promising solution. However, encouraging adoption amongst prospective end users, who are often working in informal, cash economies is no easy feat.

In this paper, we examine the introduction of mobile payments into a previously solely cash workflow: a loan payment/collection workflow. Consisting of auto-rickshaw drivers (payees) making payments to a social enterprise through its non-governmental organization (NGO) partners (collectors) in India. The auto-rickshaw drivers had taken out relatively substantial loans to buy their auto-rickshaws, around 1.5 lakh rupees (2000 euros), with the majority of the drivers in this study earning roughly 800 to 1200 rupees (11-16 euros) per day. The loan itself is given by the bank but operated through Three Wheels United (TWU), a social enterprise, and its three NGO partners who manage the loans. The NGOs, who work in the auto drivers' communities, undertake the day-to-day business of managing collections, each having their own system for cash collections. Furthermore, one of the NGOs, NGO2, had recently introduced Airtel Money, as an alternative to cash collections. Airtel Money is a mobile payment system from Airtel, which operates on both feature- and smart-phones. Users have a mobile wallet they can top-up with cash or from their bank accounts and can make payments for goods and services.

The hope was that mobile payments would reduce the burden of cash collections on an economically stretched organisation. However, TWU wanted to understand the consequences of scaling up the Airtel Money payments. To this end, we conducted an ethnographic study of both the cash and digital collection workflows

to understand the work involved in loan payments (driver's perspective) and loan collections (organisational perspective). Research questions included: Does Airtel Money enable easy daily payments? How does the move from cash to Airtel Money impact the organizations and the drivers?

In this paper, we outline the work to make cash collections work and how introducing Airtel Money impacts on this. This study gave us a unique opportunity to compare cash and digital in the same workflow. Whilst Airtel Money is a new technology for the drivers, it seemed surprisingly usable, despite drivers having a range of print and technical literacies. Interestingly, the perceived barriers to use (low print and technical literacy and fear of errors) were not the same as the barriers experienced once the technology had been adopted (inconvenience of recharging). However, as we outline, Airtel Money is neither inherently usable, nor trusted, for this community. Rather NGO2 put in considerable work to make Airtel Money work. Whilst in the lab, the usability of mobile payment systems is depicted as a transactional concern, we reveal how once in situ usability is enabled through the socio-technical ecosystem in which the payments are being made. Furthermore, whilst Airtel Money, like many mobile money services promises anytime, anywhere payments, drivers' circumstances mean payment remains time and place bound. Finally, we show how loan payment is not simply a transactional exchange of value from payee to collector, but that loan payment is a collaborative achievement.

2   Literature Review

In 2014 there were 255 mobile money services operating out of 89 countries (Scharwatt et al, 2014). However, although most transactions in the Global North are digital, few are mobile phone based. Mobile money has had more success in some countries in the Global South. Although adoption thus far has been patchy, it is considered to be the most promising solution for digitizing payments in low income communities. In the following sections, we introduce relevant research on digital money.

2.1   The HCI of Money

Digital money systems typically aim to overcome the shortfalls of other payment mechanisms by making the *act of payment* fast, secure (Ondrus, Lyytinen and Pigneur, 2009, Balan et al, 2009, Lehdonvirta et al, 2009, Visa, 2014) or even largely invisible to the user (Lehdonvirta et al, 2009). For example, both Balan et al (2009) and Lehdonvirta et al (2009) focus on the trade-off between usability and security in their designs of new mobile money systems. Usability is measured in the lab, in terms of speed, 'cognitive load' and perceived security. The focus of

these systems is very much on improving the payment transaction, compared to other means of paying, by minimizing the costs associated with that transaction. However, research examining payment systems in natural settings (outside of the lab), reveals concerns beyond speed and security. For example, Ferreira and Perry (2014) studied the Bristol pound; a community currency in cash or mobile form. They showed how the speed of the transaction was not the only concern of users because the social context in which the transactions took place had consequences for the user experience (Ferreira, Perry and Subramanian, 2015). We describe their work in more detail below in Section 2.3. Mainwaring et al (2008), examined the various forms of money used in everyday transactions in Japan. They found that it was not so much the purported efficiency and convenience of digital technologies which were most implicated in their adoption, but rather how well the different forms fit with the social and cultural requirements of paying. Kumar, Martin and O'Neill (2011) studied small cash payments in India, highlighting the importance of a variety of practices surrounding the act of payment, such as bargaining, service support (e.g. when purchasing train tickets) and the multiple use of receipts. Vines et al (2012) examined the use of cheques by people in their eighties, and described how for this generation, cheques are part of an 'ecosystem of trust' which current digital technologies have not yet achieved.

Whilst lab studies may focus on the payment transaction as a relatively isolated and uncomplicated act, out in the world "money is embedded in social practices and has situated social meanings and uses that are constantly (re)negotiated" (Zelizer, 1997). It is clear from the studies above that the embodiment of money – whether cash, card or mobile – affects the way that money is used and understood.

2.2   Digital money in Global South

Whereas the above studies focus on various HCI aspects of money, in the Global South the focus of digital money research tends to be on technology and development, with an emphasis on the role of mobile money. This is because mobile money intuitively has a greater potential reach than more formal banking structures, even if successful interventions have been rather limited. In these settings, cashless typically means mobile because of the widespread penetration of mobile phones compared to the limited penetration of formal bank accounts (Scharwatt et al, 2014, Pickens, Porteous, and Rotman, 2009). Immense interest has been sparked by the idea that mobile money use could be tied to increasing financial inclusion for low income populations (Davidson and McCarty, 2011, Donovan, 2012, Morawczynski and Pickens, 2009, Gates Foundation (2017)). The world's unbanked typically must rely on informal financial services, often described as unsafe, inconvenient and expensive (Scharwatt et al, 2014). However, it is difficult for banks to reach out to these segments in a cost-effective manner, even where government mandates exist, leading to proposals for capitalizing on the

high penetration of mobile phones as a way of providing access to more formal financial services.

Arguably, the most successful mobile money application is M-PESA in Kenya. M-PESA enables thousands of low income users to transfer money to other users, to store value and make over the counter payments. However, its success has not been widely replicated. Mas and Morawczynski (2009) analyse the service ecosystem Safaricom put in place to make M-PESA successful and highlight the many factors which led to its success. They point to the political instability at the time, the low penetration of formal bank accounts coupled with suspicion of traditional banks compared to trust in Safaricom, as well as the rapid building and management of the cash-in, cash-out infrastructure.

M-Pesa is run by a telecom provider and has no link into more traditional banks. In many countries, the regulatory framework restricts such interventions. In India, for example, banks typically partner with other providers to produce a network of on-the-ground agents situated in low income areas who provide access to more formal banking services, often, but not always through the mobile phone. Medhi, Ratan and Toyama (2009) examined the adoption and use of m-banking services by low-income low-literate individuals in several countries and found adoption was influenced by a number of factors. These include the match between offering and need, such as whether migration patterns match the remittances supported, as well as the comparative security, convenience and cost of existing informal methods. For example, sending money home via ones extended networks was often fraught with uncertainty, whereas digital transfer was immediate and confirmed by SMS receipt. However, the highly textual nature of SMS receipts and digital media in general was problematic for many of the low literate users who were concerned about the consequences of and recovery from error e.g. tracing money which has gone astray.

2.3   Digital money in the organisation

As well as remittances and peer-to-peer payments money is often exchanged as part of an organizational workflow, to a merchant, from an employer, etc. Several studies have examined how different forms of money impact on organizational workflows and how changes in the type of money accepted, e.g. moves from cash to digital, have consequences for those workflows. Indeed, the fastest growing sector for mobile money in 2014 was merchant payments, bulk disbursements and bills (Thomas, Jain and Angus, 2013). Kumar, Martin and O'Neill (2011) studied various cash payment situations in India, and discussed how mobile money might fit into or disrupt existing workflows. They described how the tangibility of money helped to ensure everyone paid, even on crowded buses, how receipts take many forms, serve multiple purposes and are often used to order that workflow e.g. bus tickets demonstrating payment or dinner tokens being used to place the order at a

subsequent counter. Furthermore, payment is often interwoven with other services, such as train station counter staff checking the paper slip to ensure customers are purchasing the right ticket. The tangibility of cash is used to manage the workflow particularly in crowded and pressured situations where one-by-one queues are rare. However, it also has downsides such as the problem of having the right change, the time-consuming nature of cashing up and so on. They concluded however that as long as feature phones predominate (with the consequent reliance on USSD (Unstructured Supplementary Service Data) and SMS (Short Message Service) for digital money services), that mobile money will be unlikely to become a mainstream part of many small payment workflows as it would require too much workflow disruption for too little benefit.

Pritchard, Vines and Olivier (2015) studied what happened when cash was eliminated from London buses. Whilst Oyster cards using Near Field Communication (NFC) had been in use for some time, previously they had been used in parallel with cash. Like Mainwaring, March and Maurer (2008), they found that it was easy for users to run out of money unexpectedly, because Oyster cards do not afford easy awareness of how much value remains. As a result, passengers may be refused entry to the bus. The consequences for some passengers are compounded by the problems of infrastructure, because particular places (often lower income areas) at particular times (e.g. late at night) do not enable easy recharging. The move away from cash also caused organizational changes, with drivers spending less time interacting with passengers. Many drivers appreciated this, and it may be viewed as a reduction in workload. However, they showed how workload cannot simply be measured as quantity of interactions; whilst drivers had less interactions with customers, the interactions they had tended to "be adversarial and a result of problems to do with payment." (p913, Mainwaring, March and Maurer, 2008) thus increasing emotional labour. Finally, drivers now had to make decisions about who was 'vulnerable' and who was not, as they were under remit not to abandon vulnerable passengers. This is extra work for the drivers, which they are not trained to undertake. As a consequence, these decisions were prone to bias and not always fair (Pritchard, Vines and Olivier, 2015).

Ferreira, Perry and Subramanian (2015) studied cash and digital versions of the Bristol pound in face-to-face merchant-customer payment situations. Whilst the design of payment technologies tends to focus on efficiency and speeding up transactions, they describe how the social interactions in payment situations were appreciated and seen as opportunities to build community (Ferreira and Perry, 2014). In this case the design of the digital payment solution, does not need to emphasise efficiency, rather it is the smoothness of the transaction that is important. In Spending Time with Money, Ferreira, Perry and Subramanian (2015) describe how decisions on whether to trust the SMS receipt are not made in a vacuum; instead they are part of the "social and contextual fabric against which the transaction occurs" (p1230). In this case, the transactions are made in the small

shops, cafes and so on which are part of the Bristol pound network. The ecosystem of the Bristol pound and the settings in which the transactions occur impact on problem resolution. For example, shopkeepers don't necessarily make the customer wait for the confirmation SMS to come through in situations where there is a delay, instead trusting them to have made the payment.

Blumenstock (2015) conducted a Randomised Control Trial in Afghanistan where half of a large set of the employees of a development organisation were paid digitally and half continued to be paid by cash. The aim was to understand whether moving people onto digital money improved financial inclusion. They found little evidence that digital payment helped, with most users withdrawing all or almost all their money in one go and little evidence of the accumulation of increased savings. In contrast, the digital payment process conferred tangible benefits on the employers who reduced the costs of their workflow by removing cash handling and reducing the opportunities for fraud.

2.4   The affordances of paper in low-income, financial workflows

The affordances of paper in workflows has been a topic of interest to HCI for some years (e.g. Sellen and Harper, 1997, 2003). Cash itself is often a paper artefact and cash collection workflows in low income settings typically rely heavily on paper. It is therefore worth reflecting on the role of paper in payment and collection workflows in low income communities. Ghosh and colleagues completed a series of studies on financial services for low income communities, including micro-saving accounts (cash) and m-banking solutions and highlighted the importance of paper (Ghosh et al, 2015), as well as the role of trusted intermediaries (Ghosh, 2013), in these workflows. Ghosh et al (2015) describe the properties of the paper passbook in microfinance in Ghana. Their ethnographic study found the affordances of the passbook enabled trust to be built in the system since it provided an enduring historical record of the transactions. Even though it was rarely consulted by the savers themselves, that they owned it gave them a sense of confidence in the system. In the case of Ghosh et al (2015) the savers did in theory have access to the state of their accounts through their passbooks, but in reality, were rarely aware of their balance. The routineness of the daily collections and their low print literacy, meant they almost never consulted their book nor even ensured the collector entered the correct information. Nonetheless, the passbook confers trust. The collections workflow Ghosh et al (2015) described involved a process of multiple receipting and data entry – in the passbook, paper receipts, plus the paper and electronic records in the microfinance's office. All of which was designed to prevent errors and build trust at each stage of the workflow. Parikh et al (2006) describe how keeping paper records alongside digital records is common since users do not fully trust nor understand digital payment systems.

Similarly, in a study of m-banking agents working for Eko (an Indian organisation which provides various financial services, such as remittances, to low income users), Panjwani at al. (2013) found that paper receipts were highly valued even though SMS receipts were provided by the system. M-banking agents therefore produced paper receipts alongside the SMS receipts, even though they had to fund this themselves and it was officially discouraged. Each method of receipting has its own affordances and it was only *in combination* that customers had confidence in the system. Paper receipts were particularly useful where the SMS was delayed or the system was down, in which case the agent took the money and made the payment later. In these cases, the paper receipt saved the customer time coming back to the shop or waiting until the confirmation arrived. Paper receipts were also more accessible as they were written in the local language unlike the English SMS. However, the SMS provides confirmation that the money has reached the recipient. Each system has advantages and disadvantages in terms of record keeping. Whilst SMS's often get deleted, the mobile phone provides a portable record of (at least recent) transactions and is less likely to get lost. Even where workflows have been designed to be digital, paper still serves a valuable function, helping to build trust and confidence and as a workaround to system inefficiencies.

In this paper, we contribute to the lines of research outlined in the preceding sections by exploring the implications of two different forms of money, Airtel Money and cash, in a low income setting in Bangalore, India. We seek to understand how each method of payment impacts on the loan collection workflow and its usability for the auto-rickshaw drivers and the organisation. Before we describe our findings, we describe the field setting and outline our methods.

3   Field Setting and Method

The organizational structure of loan management and collections is a little complex, so we start by describing how TWU operates. TWU is a social enterprise, i.e. a for-profit organisation with a charter to do social good. In this case, improving the lives of auto-rickshaw drivers by enabling them to purchase their own auto rickshaws. Banks are typically unwilling to lend to auto drivers because of their high risk of default and lack of credit history. TWU acts as an intermediary between the banks and the drivers by standing guarantor to the loan. TWU mitigates the risk through:
1) Daily payments. Since auto drivers earn a small amount of cash daily it is virtually impossible for them save for large monthly loan payments, TWU aims to collect from the drivers daily;
2) In lieu of a credit rating, drivers are recruited through NGO partners working in driver communities and recommendations from existing members;
3) Social pressure from the NGO partners, TWU and other drivers is used to counteract non-payment.

4) Whilst the loan from the bank is a five-year loan, the repayment contract with TWU is to repay over three years. This is a key principal as auto-rickshaw drivers' economic circumstances mean that even with the best will in the world drivers are likely to miss some payments. The buffer provided by overpaying to the bank mitigates this risk for both the drivers and TWU.

At the time of the study TWU was operating only in Bengaluru, a large city in Southern India (population: >8 million)[1]. TWU oversees the operation of three NGO partners who operate in auto-rickshaw driver communities all over Bangalore. These NGO's source drivers and run the day-to-day collection activities. Each NGO has a different cash collection process:

• NGO1 operates daily and weekly door-to-door cash collections: NGO1 works with drivers' wives and its agenda includes female empowerment. They recruit their all-female staff from the communities they serve. The collectors go door-to-door to collect cash from the drivers' homes. The houses and apartments are typically densely packed and collectors cover sets of drivers typically within walking distance or a short bus ride. Drivers can choose to pay on a daily (preferred) or weekly schedule. NGO1 had the largest number of drivers in the scheme and operated in several areas across the city. They had around 20 collectors to manage about 500 drivers.

• NGO2 operates drop-in cash payments and Airtel Money. Drivers can come into NGO2's office to pay cash anytime during office hours or sign up to pay through Airtel Money. At the time of the study, NGO2 had 80 drivers paying by Airtel Money and 23 by cash. Collections were managed primarily by one person, Priya[2].

• NGO3 holds weekly cash collection meetings from a small office space, in a narrow side street, in the area where most of its 50 drivers live. The collection times are 4-6pm Sundays. Drivers turn up during this time and pay their money to NGO3's dedicated collector, Ramesh.

Once received, drivers' payments are split into four buckets: 1) The auto-loan, which is the 36-month loan drivers take out with the bank to buy their auto-rickshaw; 2) the Safety Deposit Loan (SDL), a smaller loan, over 18 months, that most take out because they cannot raise enough capital for the full deposit; 3) savings, a portion of the drivers' payments are put into a savings account which is locked in until they finish their loan; 4) TWU fees.

At the time of the study, most TWU payments were in cash. TWU wanted to scale up their operations in a bid to achieve profitability. From their side cash was time consuming, costly and risky to collect. They were therefore interested in understanding what would be the consequences of moving away from cash towards a larger scale deployment of mobile payments.

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[1] It has since expanded to two other locations Chennai and Chitradurga.

[2] All names have been changed for the purposes of anonymity.

Figure 1: Poster advertising the daily payment scheme in NGO1's office

3.1 Methods

We conducted an ethnographic study of loan collection and repayment practices in 2015. We used observation and in-situ and semi-structured interviewing to get a rich picture of loan collection and repayment from the perspective of the various actors involved, namely, the drivers who were repaying the loan, the collectors from the NGO's, the NGO's back office staff managing the collections and TWU's back office staff overseeing collections for the three NGO's and allocating the drivers' payments into the four buckets.

In total, we conducted 33 semi-structured interviews with drivers, 20 who paid by cash, one who paid by cheque and 12 who paid by Airtel Money. The interviews included questions on education; family; technology use; financial circumstances, including income, savings; and their experiences with the TWU loan. Drivers who did not use Airtel Money were probed about their perceptions of it. The interviews were conducted in Kannada, the local language of Karnataka state, by the second and third authors.

We conducted observations of and in situ interviews with the collector(s) in each NGO. This included accompanying two collectors from NGO1 on their collection rounds and in the back office, attending loan collection sessions with the NGO3 and spending time in the NGO2 office, where we observed drivers coming to make payments as well as having walk-throughs of the Airtel Money process. We interviewed the back-office staff at the NGOs and TWU to understand their processes and practices; having walk-throughs and collecting artefacts (such as spread sheets and emails) as appropriate. The observations were recorded through extensive field-notes, often taken by two researchers. For example, the Kannada

speaker would record in as much detail as possible the interactions between the NGO representatives and the auto-drivers, whilst the first author recorded as much of the other detail as possible. After a day in the field, the researchers collaboratively wrote up their observations to get a more complete picture than either individually could record.

Data was collected through field-notes, audio recordings and photographs. The interviews were translated and transcribed. Our analysis took a broadly ethnomethodologial perspective (Garfinkl, 1967). Ethnometodological ethnographies explicate the knowledgeable, artful ways in which participants organise their practice and reveal the ways in which technologies and other artefacts are used as part of the accomplishment of that practice (see e.g. Button and Sharrock, 1997, Randall, Harper and Rouncefield, 2007). The authors read through and discussed all the observations and interviews in various analytic sessions. They organized them into themes as interesting topics began to emerge from the data. The findings and themes outlined here were emergent, that is, they came from the data itself. Before describing our findings, we introduce the participants.

3.2 Participants

The auto-rickshaw drivers: All the drivers were male and three-quarters were between 30 and 50 years old, which is representative of auto drivers in general (Citivas Consultancies, 2010). As well as Kannada, most drivers spoke at least one other language (typically Hindi, Tamil or Telugu) with over half speaking three or more languages. Only five drivers owned a personal smartphone, but none had data packages. Indeed, no drivers we interviewed had accessed the Internet, except for a few drivers who used Ola Auto. Ola is an app-based taxi and auto hailing service. However, even those who used Ola Auto only used the internet for that purpose and the smartphone they were using was a locked phone given to them by Ola. Five participants had never been to school, 14 finished primary school and 14 completed high school.

The collectors: As mentioned NGO1 recruited its collectors, known as organisers, from the communities it served, they were exclusively female with a range of education levels, typically finishing school at 16 or younger. We shadowed two collectors:

- **Collector 1**: Zoharin3 collects from 20 drivers. She was 47 years old, had studied to 7th grade, and previously worked as a cook and babysitter in a school. She had worked as a collector in the area she lived for two years. Since she had lived in this community for 28 years, she knew many of the families there.
- **Collector 2**: Haniya collects from 24 drivers. She was 17 years old, had studied to 11th grade. She had worked as a collector for 3 months. Her collections

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[3] All names have been changed.

cover five areas which are relatively close to one another, but do involve a couple of short bus journey's.

Neither collector that we accompanied was computer literate, which was typical for NGO1's collectors.

We were accompanied during the collection rounds by two senior coordinators (one with each collector), each of whom had been working for NGO1 for over 10 years and were in charge of training and managing the collectors. For example, if a collector was struggling to get a particular driver to pay they might ask the coordinator to intervene. NGO1 also had several back-office staff who variously checked the ledgers, counted the money, entered the driver and payment details into the computer and sent out the SMS's. These staff had a higher level of education and administrative experience than the collectors.

NGO2 had one primary collector, Priya, who handles both cash and Airtel Money payments. She was in her mid-thirties, college educated and computer literate. NGO3 also has one primary collector, Ramesh, who was in his 50's and had some accounting experience. Unlike the collectors in NGO1, Priya and Ramesh also managed the back-office work including updating the digital records (primarily in Excel). However, Ramesh told us he was not particularly comfortable with computers.

The financial manager at TWU was Viren, he's in his late twenties, holds a MBA in Marketing and Retail Management and is computer literate. His work consists of tracking the drivers payments and manually allocating them between the four 'buckets' (auto loan, SDL, savings and TWU fees). His tools of work consist of hundreds of Excel sheets, plus Cyclos, the open source software they use for managing the drivers loans.

4 Findings

In this section, we describe the work of loan collections (for the organisation) and loan payment (for the drivers). The focus will be on examining how cash collection compares to Airtel Money, from both the organizational and drivers' perspective.

4.1 The loan collection context

Surveys typically classify Indian auto-rickshaw drivers as urban poor (Subhashree Sheik Abdullah, 2014). Drivers earn small, variable, amounts of cash daily, depending on luck, passengers, days of the week, festivals, working hours and so on. As rough daily averages, fourteen drivers earned less than 800 INR, nine up to 1000 INR (~14€), three sometimes earned 1200 INR and seven said their earnings were too variable to estimate. How well the drivers were doing financially depended on a number of factors outside of their daily earnings. These include, the size of the family living with them, who else was earning at home (around half the

drivers were the sole earners in their families), and their other commitments. Some drivers were really struggling – for example, older drivers who could not work such long hours or drive so far, drivers who had sick family members and drivers with other debt. Other drivers were doing well, not only paying off their auto-rickshaw loan but also making additional independent savings. The majority however, were just getting by – that is they have enough to cover their daily living costs but do not have spare cash for 'extras' whether this is medicine, school fees or whatever. For many drivers, as we shall see, meeting the loan payment can be a struggle.

All the drivers had bank accounts, because of their auto-rickshaw loan, however only 16 were active users, with the biggest reported barrier being limited funds. As NOS eloquently put it "Procedurally, it's not difficult to carry out a transaction in a bank. […] Of course, it's a lot simpler if one has some money". Whilst most had enough to cover their daily expenses few were able to save. Drivers understood the importance of saving and wished to do so, but their difficult financial circumstances prevented them building up longer term reserves[4]. Including drivers who made savings at home (e.g. gold or jewelry), just over a quarter of the drivers interviewed reported making regular savings. As a consequence, several drivers mentioned they were glad of the savings they were making through TWU. Unfortunately, in reality constant loan underpayment meant few were actually making these savings either. With no buffer against financial shocks, we classify the majority of drivers in our study as financially vulnerable.

This context sets the scene for the loan collections. Given the drivers vulnerable financial situation, TWU has to balance the needs of the drivers for flexibility and support in loan payment (and to achieve their goal of paying off the loan) with their own need to operate as a viable business. Even with TWU as an intermediary, the banks are cautious about loaning to auto-rickshaw drivers and any fall in overall collections means they stop issuing new loans.

4.2   Payment schedules

One way in which collections can better support drivers' income patterns is through daily collections. This is a known micro-finance principal for loan payment, savings (e.g. Ghosh et al, 2013) and so on. It is easier for drivers to pay ~200-220 INR daily than trying to find ~5200 INR once a month, furthermore taking the money regularly means it cannot be spent elsewhere. As GZC says "I cannot save up to pay monthly because I know I will spend it on something or the other". In reality however less than half of TWU's drivers pay daily. Two of the partner NGO's offer the opportunity to pay daily: NGO1 and NGO2. Drivers with NGO3 pay weekly. Only 7 of our 33 interviewees paid daily: two with NGO1, one who

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[4] As reported in Portfolios of the Poor (Collins et al, 2009), the drivers actually used a portfolio of instruments for managing their money, here we are talking only about what drivers themselves classify as savings, which are bigger, more enduring sums in the bank or gold or jewelry.

lived next door to the collector from NGO2 and four paying by Airtel Money. However, we met many more drivers who paid daily during our observations of NGO1's collection rounds.

Almost all the drivers we spoke to said they put aside the loan amount daily, whether paying by cash or Airtel Money. BOS is typical "If I keep money aside every day for the loan it is much easier for me than saving up at the last moment". However, consistent with Ruthven (2002), drivers reported that putting cash aside at home is not equivalent to making a daily loan payment as there is a greater risk of spending it. Furthermore, there is more likelihood of not putting enough cash aside with the idea that it can be made up tomorrow. Whilst this adds much needed flexibility given drivers variable earnings, it can be a problem to make it up if drivers are going through difficult times. Daily cash collections are however quite burdensome for the collectors (NGO1) or drivers (NGO2), being time consuming and costly.

If daily cash payments are difficult practically, weekly payments seemed to be manageable for many drivers who are 'on top of things'. Some drivers preferred them, as it enabled them to balance their variable daily earnings without falling behind or missing payments, e.g. GZC "Sometimes if I'm short before the next payment, I work extra hard on Friday and Monday and make sure I always pay on time". It becomes riskier for drivers who are struggling to pay or already most at risk of falling behind.

To summarise, the principal of daily payments fits with drivers practice. Certainly, all the drivers tried to save up daily even if they did not make daily payments. However, since saving up daily is not the same as making daily payments, a system which enables daily or close to daily payments is indeed best suited to the drivers' income patterns. Daily cash collection is burdensome and expensive, however, so TWU had turned to Airtel Money in the hope that it would enable more scalable daily payments. In the next sections, we outline the work of cash and Airtel Money collections and how Airtel Money fairs in practice compared to cash collections.

4.3   Cash collections

Each of TWU's partners operates their own cash collection process: NGO3 has weekly payment hours in a specific location, NGO1 goes door-to-door daily and weekly, and drivers drop into NGO2 anytime during office hours. Once the driver is with the collector, the basic process follows a similar pattern [See Figure 4]. The driver tells the collector how much they are going to pay. Where the driver is paying the expected amount, he gives the collector money which the collector receipts. Each driver has a yellow TWU book in which each payment is recorded (payment date, amount, collectors' signature). The book has spaces for the division of that amount into three parts – the loan, the RD (savings) and the TWU fees – but these

are left blank. That allocation actually happens in the TWU back office and neither collectors nor drivers receive information on these allocations – although they are kept up-to-date with any overall backlog in payments received (known as balance). The TWU book belongs to the driver, although some drivers leave them with the collectors. The NGO also keeps a signed record of the payments. NGO1 does this through carbon copy receipt books carried by each collector. In which the collector records the date, drivers name, area, amount paid and signs it. One copy is given to the driver, the other kept by the NGO. When the collectors deposit their collections in NGO1's office, the receipts are used to collate all the entries into a single log book.
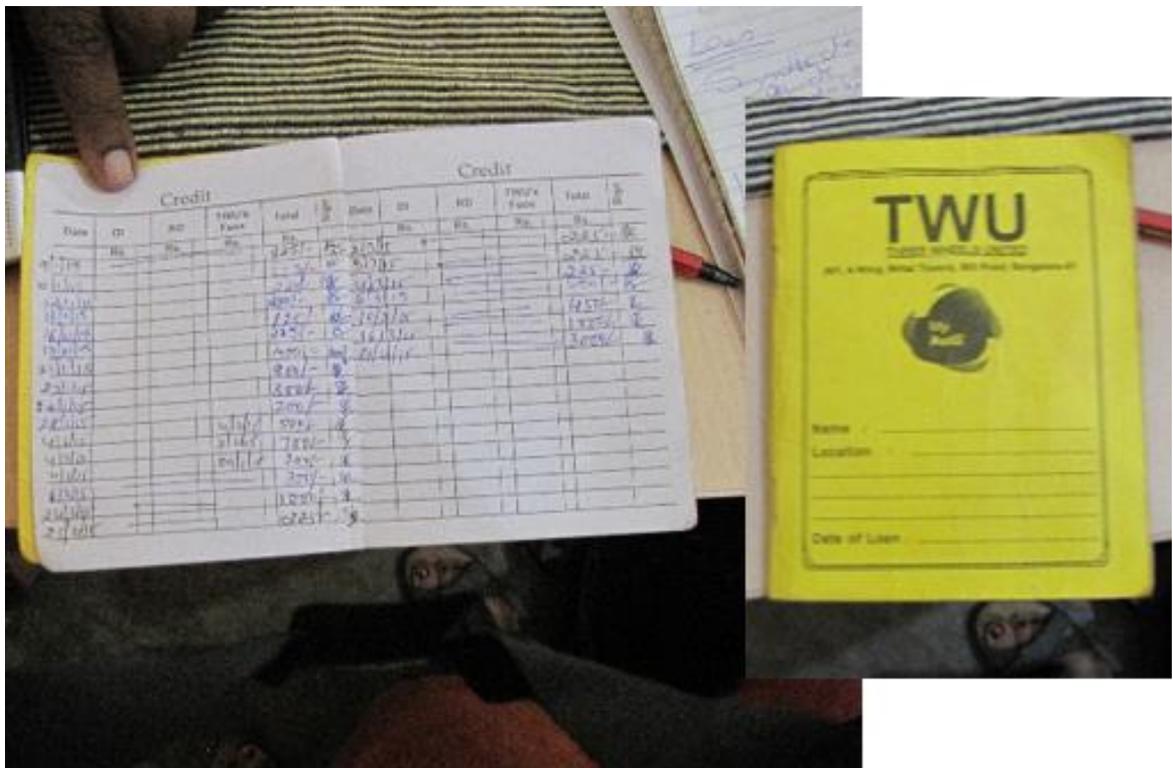

Figure 2: Yellow TWU Book

Figure 3: Zoharin collecting from drivers home

Driver pays cash recorded in TWU book

NGO keeps a record: either receipts (NGO1) or signed record book (NGO3)

Driver receives SMS (using TWU system) to acknowledge payment

Most collectors also keep their own record

Figure 4: Cash Collection Process – Driver Facing

Information from receipts entered into record book at the end of the day/week in NGO1 office

Then it is entered into the challan as a running daily record of how much money has been collected from whom.

The total cash for each organiser is counted and deposited with NGO1. The running total from the challan is entered onto the organisers receipt book

An email is sent daily to TWU telling who has paid what

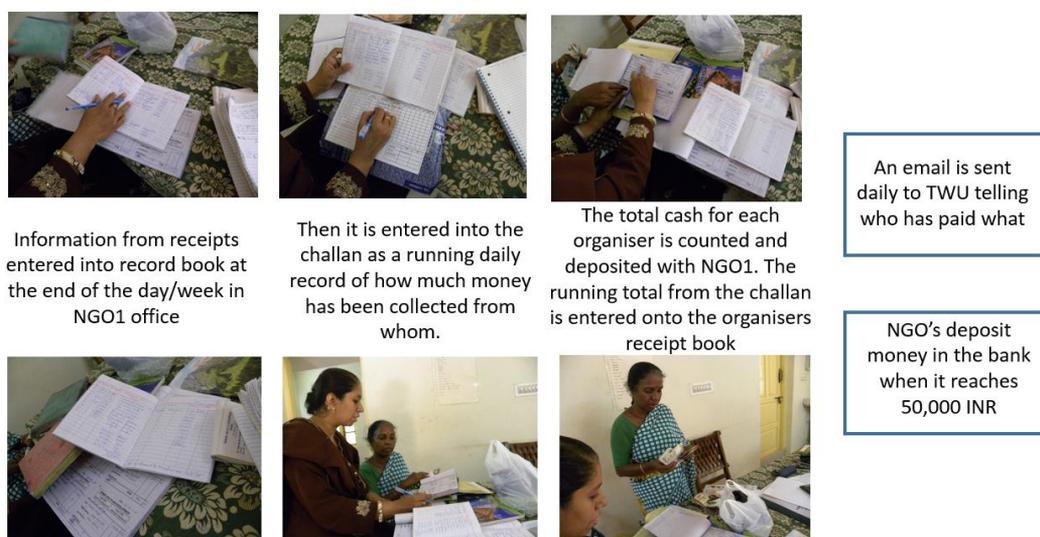NGO's deposit money in the bank when it reaches 50,000 INR

Figure 5: Cash Collection Process – Back-Office NGO1

Since most collections are done by one collector for NGO2 and NGO3, rather than using a receipt book they directly enter the details into a single log book. Each entry consists of a line number (running in sequence), drivers name, mobile number, date, amount. Zoharin also kept her own log book recording the collections she had made since her last visit to the office. She recorded the date, the receipt number, the drivers name and amount paid, using a new page for all the collections made between visits to the back office. Before going to the office, she totaled up the amount collected and made sure the cash she had was the expected amount. She made entries in her log book after each round of collections copying the information from the receipts into the book. The collectors also keep a paper list of the drivers they collect from and their phone numbers.

4.3.1 Paper-digital interfaces

As well as these various paper-based records, information on all the payments is also digitised. There are a number of interfaces between the paper and digital systems. The first of which is an SMS system, intended to be used by the collectors at the time of collection. The collectors send an SMS to the TWU Cyclos system, with the amount the driver has paid. The drivers then receive an SMS from Cyclos acknowledging payment, which provides an official record of payment received. However, whilst the SMS is meant to be sent immediately, it does not work quite like this in practice. Priya, who deals with drivers coming in periodically, usually sends the SMS immediately. Ramesh may send the SMS immediately if there are no drivers waiting to pay, otherwise he sends them when he has time between drivers or at the end of the session. The collectors from NGO1 typically do not send the SMS themselves at all. Their head office was concerned it would be too difficult for them and that their low technical literacy would lead to mistakes. Instead the back-office workers take care of it after the collectors have deposited their

collections (which could be the same day or once a week depending how far collectors are located from the NGO1 office). The SMS system was actually designed in part to mitigate the risk of cash collections – collectors are assigned a limited amount of money that they can collect e.g. 10,000 INR before depositing it at the NGO office. Each SMS sent deducts some money from this 10,000 limit and when they reach their limit they cannot collect any money (or at least send any SMS's) until they deposit the collected money at the NGO office. Of course, since the money they collect is cash, the digital record of that collection is disassociated from the actual collections and relies on adherence to the process to make sense. In practice, this process does not function as intended. It relies on the drivers to be partial enforcers, e.g., to insist on an SMS at the same time as they have made their payment. However, given that they have had their TWU book filled and signed and seen an organizational paper record (whether log book or receipt book) being filled, why would they? Of course, the system SMS is the most official confirmation that the money has been received by the organisation, so one might expect it to be most trusted. However, unlike Panjwani et al (2013), the SMS does not mark the actual physical transfer of cash, just the recognition that TWU has been notified of its transfer from driver to collector. Even in Panjwani et al's (2013) study the paper receipt often sufficed. In this case, not only do drivers already have at least one official, albeit paper, record of this, it is also not certain that they even expected immediate SMS notification, as this was never implemented with NGO1's drivers. We would argue that the whole structure of cash collections – from multiple receipting to the relationships built over time with their collectors, who anyway work for trusted NGO partners – builds an ecosystem of trust in the collection process. The SMS receipt is just one part of this ecosystem and that it is typically received some time after the cash collections have taken place is no cause for alarm.

The second interface between paper and digital occurs in the NGO's offices and runs in parallel to additional paper workflows. For the collectors from NGO1 all the information from the receipts is entered into the central paper log book at the end of the day/week. The information from the log book (for all NGOs) is entered into a paper financial record, called the challan, which is a carbon copy book - as a running daily record of how much money has been collected from whom. These updates are made by the office staff for NGO1 and the collectors for NGO2 and NGO3. The total cash collected is counted and matched to the records. For NGO1, the running total from the challan is entered onto the collector's receipt book as proof the money has been received. The collector at NGO2 also keeps a digital Excel spreadsheet, with one page per driver, containing date and amount of payment (and whether cash or Airtel Money). She uses this to keep a running total of how much has been paid by each driver and any balance they have. At the end of each day an email is sent to TWU telling them which drivers have paid and how much, so they can update their records. The NGO's deposit the money in TWU's bank account when it reaches 50,000 INR.

In the TWU back office the information from the three NGO emails is entered daily into their own Excel sheet containing each driver's payment history. The allocations (i.e. division of the received payments between the four buckets and transfers of the money to the bank) are made periodically, using a mixture of Excel sheets, a custom-made database where the SMS logs are received and an open source software known as Cyclos. The finance manager, Viren, matches the SMS logs against the records received by email from the NGO's and the amounts deposited in the TWU bank account, then manually divides the amount each driver has paid between the four buckets. Since the majority of drivers are underpaying, this allocation is made according to urgency, that is which loan bucket needs money most to prevent it 'going bad'.

4.3.2   Chasing loan payments

Of course, drivers do not always pay the right amount on time and this necessitates a whole set of extra work that turned out to be of consequence for any move to digital money. Drivers who are not going to make a payment may notify their collector, some even meet them to explain why, thus maintaining their reputation as reliable. Others try to avoid the collectors, by not turning up or being out. Collectors phone any drivers they have not seen and if they cannot contact them, they escalate their attempts. Typically going around to their houses, engaging more senior people as the situation becomes more grave, and finally with a group made up of representatives from all three NGOs and TWU. This puts real pressure on the drivers to pay, as it makes public in the neighbourhood their problems and most drivers report trying to avoid this.

A major part of the collector's job is chasing up the loan payments from the drivers for whom they were responsible. Thus, each NGO operated additional modes of collection. Ramesh would arrange to meet drivers, who failed to pay on Sunday, at a place and time of their convenience during the week to take payments. We also saw payments being given in an ad hoc manner to community workers from the NGO3 if the driver spotted them on the street. They would accept the payment, record it in the driver's yellow book and pass the money to Ramesh when they were next in the office, so he could record it in the log book and send the SMS. If drivers did not have the money or were not in when the collectors from NGO1 went around they would be asked to go to the office to pay. Some drivers who lived near the collector from NGO2 would directly go around to her house to pay.

4.4   Airtel Money collections

Only NGO2 adopted Airtel Money. The other two resisted citing drivers low technical (and print) literacy and, crucially for NGO1, that collections were part of its empowerment work. NGO2 adopted Airtel Money about a year before the study. Initially, only a few drivers agreed to participate. However, two factors changed

this: 1) NGO2 instigated a big training drive to improve drivers' confidence with Airtel Money, and 2) they moved their office 10 km away, which encouraged drivers to take up Airtel Money to save on travel. This created a community effect - once drivers knew others who were successfully using it they were more willing to try and even drivers living closer to the new office adopted it. Of 103 drivers with NGO2 at the time of our study, 80 used Airtel Money and 23 cash.

All the drivers used the USSD Airtel Money service on their feature phones. NGO2 helped the drivers set up their Airtel Money account. Once set up making a payment is a simple four step process. NGO2 saved a phone number on the contacts of the auto-drivers and it is to this number they make their payments. The driver calls the number, which returns a single item menu in English asking "Enter the amount to deposit", the driver enters the amount in a text box and presses send, he confirms the amount by pressing "1" and then enters his PIN for authentication. Once done, Airtel gives a confirmation on another menu screen which says "The transaction is being processed, you will be sent an SMS shortly". The driver gets an SMS from Airtel confirming the transfer has been completed, with the transaction ID, amount and date of payment.

At the backend, the money from Airtel Money payments goes directly into TWU's account, giving NGO2 no record of the payments. The collector asks the drivers to forward the Airtel Money SMS to her but only a few of them do so. Where they do, she records the date, amount and transaction ID number in a paper record book and the Excel spreadsheet. Since she is ensuring drivers keep up-to-date with their loan payments, she keeps track of the total amount paid per driver and calculates any balance. However, since she does not get details of all the Airtel Money payments from the drivers, TWU sends her a monthly statement of all the transactions that have taken place through Airtel money and she cross-checks her entries with this to keep track of her set of drivers. This means that for most drivers she can only follow up with those falling behind on a monthly basis. This is far from ideal, as we see if we compare it with Ramesh, who by the time a driver has missed three weeks of payments (i.e. before a month is even up), has been round to their house to chase up payment. Despite this Priya prefers Airtel Money as the record keeping is less burdensome.

TWU receives a daily record of all the transactions made through Airtel Money. However, these are labelled with amount and transaction ID, not driver phone number, so TWU are not able to reconcile them with their own records. Instead they have to wait for a weekly report from Airtel Money including the drivers phone numbers. When this arrives, they are able to update their records as to who has paid what and to allocate those payments to the relevant buckets. For TWU, this delay is considered a major downside of Airtel Money: although the money goes directly into the TWU account, they cannot use it until they can update their records of who has paid what. The second downside to Airtel Money for TWU, is the transaction fees which TWU covers for the drivers. Nonetheless, Airtel Money was seen as a

promising route to reducing the cost of cash collections and enabling daily payments, but TWU wanted to understand the implications of scaling up.

4.5   Trusted paper or new technology

Paying by cash is face-to-face, familiar and trusted and the combination of the physical hand over, plus multiple layers of entry and receipt help create an ecosystem of trust. In comparison, mobile money is relatively new and of necessity technology-mediated. The auto-rickshaw drivers in our study had had little exposure to digital technology. They used their phones for calls, some read SMS's and a small number had recently started using Ola Auto. Nonetheless the idea of making payments through a mobile phone is a new one for the drivers. Unlike cash, the Airtel Money exchange is purely digital and cannot be observed. The SMS provides confirmation that the payment has been made and some drivers are happy with this. However, this is not the same as actually handing over the cash and some drivers take extra precautions to ensure their payments are received, e.g., BKJ:

> "After the transaction, I send the confirmation SMS I get from Airtel to the NGO2 office which has a transaction ID. I then call NGO2 to cross check whether they received the SMS".

Although it is rare, problems can arise and payments fail to go through. Since drivers start with little confidence and trust in the system, they have a low tolerance for failure and a couple had stopped using Airtel Money because they either had, or believed they had, experienced problems.

4.5.1   Non-users' perceptions and users' experiences of Airtel Money

Whilst a few non-users would be willing to try Airtel Money given the right training, most did not want to. Reasons included:

1) **Low technological and print literacy** creating a perception that Airtel Money was too hard. CIC (NGO2): "This new office is far from my place. But I don't want to use Airtel money because I think it's hard" GZC (NGO3). "I have never tried Airtel money never wanted to try because I can't read". 2) **Language**: in contrast to Ola, which is in both English and Kannada, Airtel Money is only in English and drivers were concerned that if they made a mistake they would not be able to understand the Airtel Money messages. 3) In fact, the **consequence of errors** was a big concern to non-users, e.g. sending money to the wrong person. The way the system was set up, with the number stored in the contact list, made this unlikely as long as the drivers only used Airtel Money to pay the TWU loan. How to resolve errors is a common concern especially where users feel they will not fully master the technology (Medhi, Ratan and Toyama, 2009). 4) A couple of drivers mentioned the relative **lack of tracking** with Airtel Money, as the yellow TWU book would no longer be updated. Finally, one driver each mentioned 5) **potential misuse** by their kids and 6) the burden of **transaction fees**. The driver concerned about the transaction fees had misunderstood since TWU pay the service

charges, which were also much less than he assumed. However, such perceptions form very real barriers preventing adoption.

Interestingly when we compare these perceptions with the experiences of Airtel Money users, we find that the most commonly mentioned concerns of low print and technological literacy, language and making mistakes, did not turn out to be the main problems users encountered. Trying something new and technology-mediated, particularly when it is related to money, is perceived as risky and it was not so simple that drivers could just use it without training and support. However, even very low print and technologically literate drivers, successfully used Airtel Money, as BCN who can't read and write and never went to school testifies

> "I find Airtel Money very simple. I started using Airtel Money from the beginning of my loan. I understood how to use Airtel Money very quickly, in a single day".

It takes a certain confidence and trust however, as such drivers can only follow the given steps, not interpret any errors. The four-step process, requiring only numbers to be entered does make carrying out the transaction at least manageable, especially since many people with low print literacy are numerically literate (Ratan et al, 2010). Whilst Airtel Money appears easy to use, there is a learning curve which is steeper for some drivers than others and whilst most drivers who tried it continued, some dropped out e.g. NIE "out of the fear of making mistake".

That it was used even by drivers who didn't go to school is largely testament to the hard work NGO2 put in converting and training drives to, overcome both the perceived barriers and the actual learning curve, as BKJ testifies:

> "Initially I was scared that I may make a payment to the wrong number but I got the confidence later when I was taught and found it simple to do."

4.5.2 The organizational perspective

From the perspective of TWU, Airtel Money is less costly, time consuming and error prone than cash collections. Using Airtel Money could reduce the number of collectors required, however, this is not necessarily seen as a positive. NGO1, for example, uses cash collections to provide women's employment and were strongly resistant to introducing Airtel Money, despite finding it difficult to recruit and keep good collectors. It should be noted that even with Airtel Money not all collections work would go, since face-to-face interactions would remain for drivers who were not making the expected payments, however using Airtel Money would almost certainly reduce the number of collectors required overall. For TWU this concern needed to be balanced against 1) the high costs of operations, meaning they were not breaking even and 2) the relatively low rate of collections, particularly by NGO1. Furthermore, compared to cash, Airtel Money reduces the risk of accounting problems, losing money, fake notes and so on. Current risk mitigation practices, such as multiple entry are time consuming and workers frequently copy

from one book to another. In comparison to cash therefore, Airtel Money seems to offer distinct advantages to TWU.

4.6   Airtel Money: anytime, anywhere payments?

Given that drivers get paid almost entirely in cash and that drivers have concerns about Airtel Money, what motivates them to use it? Much of the trustworthiness of cash comes from its physicality, the downside of this being that the driver, or representative, has to meet with the cash collector to hand over their payments. NGO2 capitalised on this when they moved offices, with a big Airtel Money drive the selling point being easy, anytime, anywhere payments at the drivers' convenience. Even some drivers still paying by cash had taken this message on board e.g. SRF

> "I think it will be easier to use Airtel Money rather than pay in cash because I can make payments anywhere. I am considering switching to Airtel money as soon as possible".

Many drivers using Airtel Money also cited its convenience as its main advantage. TWL, who actually lived closer to the new office said

> "I find Airtel Money more convenient than cash because I can pay anytime, even when I have passengers or if I'm waiting at a signal. It's easy. Sometimes I say "Excuse me sir", do the payment and then continue to drive if I have a passenger in the auto when I remember to make a payment".

He goes on to say "But I pay cash if I happen to have money when I'm close to the office". The convenience of the payment mechanism is a clear driver of use and even Airtel Money users tend to pay cash if passing by the office.

TWU hoped Airtel Money would enable and encourage regular daily payments. Certainly, it can, BGL pays daily by Airtel Money

> "In the beginning, I started off by paying cash and I paid weekly […] But the distance was too much to travel and I decided to take up Airtel Money after that".

Four of the twelve Airtel Money interviewees said they paid daily, so the increased flexibility of when and where to pay can result in more frequent payments. However, for many drivers the problem of recharging is a practical barrier to daily payment.

4.7   Recharging

Drivers deal largely in cash so to use digital money they have to convert that cash to digital currency, in this case recharging their Airtel Money account at a recharge centre. Thus, whether paying by cash or Airtel Money, drivers must go somewhere to hand over their cash. The preference is to go somewhere which isn't 'out of the way', either near their home or somewhere they pass en route. Since drivers are on

the move all day, finding a recharge centre might not be expected to be particularly difficult. However, drivers reported considerable trouble finding convenient places to recharge. Few small shops offer Airtel Money recharge, as the commission is small. Only three drivers found small shops near them willing to do recharges. Whilst Airtel Service Centres do recharges they are few and far between (less than 20 in Bangalore) and tend to be busy. Furthermore, whilst drivers may cover a fair distance around Bangalore each day, where they go is dictated by passenger demand, they do not tend to drive long distances without passengers and cannot stop at a recharge centre with one on board. Topping up therefore may necessitate an extra journey. Two drivers who did not have trouble finding Airtel centres, plus one who used a small shop near his home found Airtel Money particularly convenient to use. However, most drivers found it difficult to recharge e.g. BOS

> "I find that Airtel Money is a little inconvenient because I don't find Airtel Money recharge in all shops. […] Because of this I have had delayed payments".

Three of our cash paying interviewees had given up using Airtel Money because of this. E.g. BGB:

> "That was another reason for me to quit Airtel Money, because I could only go through the whole process of payment once a week but I wasn't able to save up till the end of the week to make the payment".

Drivers mentioned problems making Airtel Money payments - because they could not find the centres, did not have time to visit them or they were closed when they got there – caused them to fall behind on their loan payments at times. Even TWL who was so positive about the convenience of anytime, anywhere payments described frequently missing payments because the office was closed when he finished work "this compels me to wait till the next day. By then I would have spent a little of the amount". There are always demands on cash in low income houses (Ruthven, 2002), so the inability to pay when the money is to-hand has knock on consequences for the drivers.

The time and effort involved in using Airtel Money goes beyond finding the centres, to recharging itself and then paying. Most Airtel Centres have self-service machines for topping up Airtel Money, but many drivers have difficultly using them as they require both English print literacy and technical competency. Three drivers also reported that broken machines were a recurring problem. TWL reported many problems topping up his account, suggesting his pronouncements about the convenience of paying by Airtel Money might have been more inspired by the rhetoric about the advantages of Airtel Money presented by NGO2 than his experience in practice.

In practice, the combination of working in a cash economy with little spare cash means that most drivers top up their Airtel Money account and make the loan payment immediately for the full amount they have topped up. Only one driver, BGL, put more into his Airtel Money account than he immediately paid, saying

"I sometimes recharge extra in my account so that I can pay off for several days without having to recharge at the center every day".

Even TWL, almost always tops up then pays. Airtel Money therefore only has an advantage if the recharge centres are easier to access than the office where they pay cash. This differs from driver to driver and is currently the main barrier to Airtel Money use. However, turning to Airtel Money can have other consequences which need to be taken into account by TWU.

4.8   The Collaborative Work of Cash Collections

Loan payment is a collaborative achievement between the driver, and his family, and the collector. Regular meetings forge relationships between drivers and collectors with several positive consequences. They help ensure that drivers are accountable for shortfalls in payment. Drivers valued the opportunity to explain when they had problems as well as the flexibility of the collectors in adjusting "for a day or two if I have a problem and can't pay that day" (TIQ). Going to see the collector even when they can't pay, helps maintain drivers' reputation as responsible loan takers who have been temporarily overtaken by difficulties. The NGOs provide a certain amount of flexibility to the drivers given their vulnerable financial situation, e.g. TLI

"the people at NGO2 are very cooperative and give me a reasonable buffer time to pay off the balance […] However, if I have a fraction of the money at that time, I pay that on that day".

This helps to create a two-way relationship, where drivers make every effort to pay but can expect reasonable cooperation from the collectors when they run into genuine difficulties. There is a flexibility to the payment system that you are unlikely to find with formal financial institutions such as banks. This helps fit the loan to the complex, often stretched, and at times plain difficult, circumstances of the driver.

Disputes can and do arise however, for example, in one house the driver's wife told Haniya that she couldn't pay because they had the money ready the previous day but since Haniya didn't come they spent it. Haniya says she came and the door was locked. Good collectors have a rapport with their drivers and the relationship is built on respect. Zoharin had lived in the community for many years and was familiar with the drivers, and confident in pushing them to pay more (although certainly not always successfully). In comparison, Haniya was much younger and hardly spoke to the drivers. Whilst this could well have been an artefact of our presence, combined with that of the senior coordinator, the coordinator also told us that it could be difficult for collectors, especially less vocal or confident ones, to deal with drivers who refused to pay.

The collectors from all NGO's know 'off the top of their heads' who is behind and who pays regularly, and make judgements about whether the drivers genuinely

cannot pay or are making excuses. For example, Zoharin told us of one household which did not pay anything on our visit 'there is always some excuse, last week someone was sick, this week it is school fees they could have paid something'. As the NGO's prioritise driver welfare, they cannot employ strong arm tactics and they have to be sensitive to the drivers' situation so rely on the collectors to encourage drivers to pay. At one house where the driver was very behind, Zoharin even employed our presence as a lever – telling the driver "see they are following me, you have to pay or I am not doing my job". That this is even a valid lever is an indication of how paying the loan off is not just a financial practice but a social one and that there is some feeling of mutual responsibility. Drivers were concerned about maintaining their relationship with the collector, the NGO and TWU, as well as their reputation in both their local community and the community of drivers with loans (as drivers were put into groups, with a spokesperson).

A key part of the collectors' job is persuading recalcitrant drivers to pay up. Each collector typically has a mixture of drivers who are paying well and drivers who are behind. During any set of collections at least some drivers will want to pay less than the required amount. Collectors rarely simply accept an underpayment; explanations are demanded, and if they are not adequate cautions are given, promises extracted; they spend time cajoling and persuading drivers to pay more. For example, one driver gave Zoharin, a 500 INR note and said he wanted to pay 300 INR, however, since he was behind with his payments she refused to give him change persuading him to pay the entire 500 INR. During our rounds with the collectors from NGO1 we encountered a number of drivers with quite a large backlog. Zoharin and the senior coordinator with Haniya spent some time with these families, explaining the consequences of falling more behind (not getting insurance, having the auto reclaimed, etc.) and trying to arrange payment schedules to clear the backlog. When drivers fall behind, even NGO2 and NGO3 go around to their houses and talk to their wives as an (often effective) way of getting the backlog cleared. Preventing drivers falling too far behind is crucial, as paying off any backlog is typically slow, and whilst they may typically raise a lump sum if the rickshaw is reclaimed, this is generally borrowed and some of the drivers we interviewed were trapped in cycles of debt from which it would be hard to escape.

As important as working with the drivers who were already in trouble, is providing loan counselling to drivers who might fall into trouble. Collectors work with the drivers and their families to help them stay up-to-date and make good decisions. For example, for the past couple of weeks one family had been paying only 1000 INR per week. Zoharin explained to driver's wife that they need to pay 1200 INR or they would fall behind. The driver's wife said that she has been telling her husband the same thing, but he had insisted 1000 was fine. Zoharin said "no, it needs to be 1200, please tell him or I'll have to tell my boss". At which the wife assured her that from next week that the full amount would be paid. In a house on

Haniya's round, the wife asks her to reduce the interest on the loan. The coordinator responds

> "That is not in our hands to change. But if you pay off your loans quickly, your interest will also reduce. Start paying more than 200 rupees each time, you will be done early and with a reduced interest".

In a third house, they are paying a little more each day to make up a backlog after they missed a few payments, the coordinator encourages the wife to pay another 50 INR a day on top since she is earning saying "don't give your earnings to your husband directly pay off this loan". Such counselling is dependant on the collector's skill, occasioned by the loan payment interaction and important in the maintenance of good payment practices. Yet the collectors are given only cursory training, whilst we may shy away from formalising such invisible work (Star and Strauss, 1999) nonetheless it seems likely the collectors could benefit from more sustained knowledge sharing and support, not to mention training in financial management themselves.

4.8.1   Implications for Airtel Money

Whilst with Airtel Money the problem cases would be managed through personal intervention, Airtel Money removes the regular face-to-face interaction between collectors and drivers and the risk is twofold 1) fewer interactions with the collectors could mean they do not build the same relationships with the drivers, which has implications for the drivers' accountability and the social pressure to pay, which is embedded to some extent in the driver-collector relationship, and 2) more drivers might fall behind because they miss out on the day-to-day loan counselling. Whereas it will be easy to identify drivers who need extra support once they are already in trouble, the number of drivers' who are prevented from falling into trouble through the collectors' hidden work is not known. Furthermore, it is not easy to identify drivers who might fall into trouble in advance since almost all the drivers are financially vulnerable.

4.9   Tracking

Drivers are concerned with tracking individual payments, they want to be sure their payments have gone through and have proof they made them. Cash provides good tracking of individual payments (physical handover and receipting), whereas tracking is weaker for Airtel Money since the virtual handover cannot be observed. Like Panjwani et al (2013), we found the SMS receipt does not have the same value to the drivers as the TWU book, as OZT explains

> "I prefer cash payment over Airtel Money because I can get the entry done in the book which I get to keep, unlike Airtel Money where no receipt is given".

The TWU book provides a historical record of loan payment as the entries are collected together in one place for easy consultation. Like the low-income savers described in Ghosh et al (2015), drivers have confidence in the yellow book, which provides a to-hand personal record of payments. In comparison, the SMS are not collected together in one view and are often deleted given feature phone capacity, the long loan period and the volume of spam. Finally, the SMS is not always believed to be 'right' as drivers' report receiving the SMS but the transaction not having gone through. To compensate, some drivers keep a diary of payments made. This is extra work and problems can arise if their records don't tally, as BGB described

> "while crosschecking these payments with my SMSs, I realized some of my payments hadn't gone through […] I ended up losing Rs.600-700 and after that I was sure I wanted to switch to cash".

Other drivers don't keep a personal record, putting their trust in the record keeping of NGO2, but this is not optimal. It should be noted that neither cash nor Airtel Money enable the drivers to track their progress through the loan. Whereas in theory they could add up all the individual payments, they do not have details of what was assigned to which bucket, changes in interest rates and fines for late payments, etc. To get a full picture of their progress through the loan they must go to the bank (for details of the auto loan and any savings) and the TWU office (for details of the SDL and TWU fees). This is time consuming and many drivers were frustrated at the lack of information on how much they had left to pay.

5   Discussion

In this paper, we have explicated how loan management is a collaborative achievement between the various members of TWU, its partners and the drivers. We revealed the large amount of organizational work that goes into making collections work, that has not been reported in other collection situations even amongst low income communities (e.g. Ghosh et al, 2015). A key issue for TWU is how to organize cost-effective daily or near daily collections, without impacting negatively on loan repayment. Mobile payment through Airtel Money seemed to offer a powerful solution, however, as we have outlined this was more complicated in practice. The setting has given us a unique opportunity to compare mobile money to cash payments, and in doing so speaks to some key themes around the digitisation of payment which we discuss below. Specifically, the importance of payment ecosystems, the impact of payment digitisation on collaborative and organisational work, and the work to make mobile money work. We close with a section which considers the implications of this study for designing accessible financial services.

5.1 Ecosystems of payment

5.1.1 Making mobile payments usable

We initially approached the problem of managing easy daily payments as one of payment mechanism, that is, which payment mechanism – cash or digital – is better? Similarly, research on designing new mobile payment systems tends to approach payment as a transactional matter and usability concerns tend to focus on balancing transaction speed with security (Balan et al, 2009, Lehdonvirta et al, 2009). However, when we examine mobile money in situ, it is clear that whilst the usability of the *payment transaction* is certainly necessary, the usability, or otherwise, of *mobile money* is a much broader matter. Payment is embedded in a socio-technical ecosystem and not only do different payment mechanisms impact on how that ecosystem functions, but that ecosystem also determines how payment functions. For example, Airtel Money is usable even by low print, English and technically literate users because it is embedded in a particular payment ecosystem. Like Medhi, Ratan and Toyama (2009), non-users were concerned about the difficulty of using the system, the chances of making mistakes and their ability to recover from them. Nonetheless, despite this, NGO2 encouraged widespread adoption through a concerted program including 1) promoting its benefits (touted as flexible, easy, anytime, anywhere payments), 2) training and 3) setting up and supporting the system over time. They used the transition point created by their upcoming office move to recruit drivers to Airtel Money, and word of mouth to encourage others to try it. Their success is impressive, but it is clear that Airtel Money's usability is not simply a function of the technology, it is *made usable for these payments by these drivers* because of the ecosystem in which it takes place.

Furthermore, certain features of Airtel Money – the non-tangibility of exchange and its limited tracking - make it less trustworthy than cash to this population but these shortcomings are overcome for many drivers because it is used within an existing trusted workflow. NGO2 put into place new processes and practices to enable trust in Airtel Money. They counteracted drivers fears about making mistakes by saving a dedicated payment number in the driver's phones and writing down the payment instructions. They provided mechanisms for double checking and tracking: drivers forwarding SMS or calling to say they have made payments, as well as the log the collector kept of each driver's payments, which could be consulted on demand. Nonetheless, drivers often keep extra paper records of their transactions, not willing to rely on the digital money infrastructure alone. Finally, NGO2's collector remained the core contact point in charge of following up drivers' loans.

In elaborating these findings, we build on the literature which shows that payments are imbued with meaning and embedded within social relationships (Ferreira and Perry, 2014; Mainwaring, March and Maurer, 2008; Vines et al, 2012, Kumar, Martin and O'Neill, 2011) and the trustworthiness of payment systems,

whether cash or digital, are socially constructed (Wolman, 2013). Research has shown that efficiency and speed are not the only concerns of users making over-the-counter payments, but that the social characteristics of the interaction are equally important (Ferreira and Perry, 2014; Mainwaring, March and Maurer, 2008). We build on this by showing the importance of the wider socio-technical ecosystem for usability and trust. Whilst previous research has examined the impact of the move to digital payments on over-the-counter transactions (e.g. Pritchard, Vines, and Olivier, 2015; Ferreira, Perry and Subramanian, 2015), in the next section we describe the implications of the move from face-to-face to remote payments, enabled by Airtel Money.

5.1.2   Loan payment as a collaborative activity

Viewing loan payment as simply a transaction where money is exchanged, does not account for the considerable work that goes in to collecting the loan. Cash collectors do more than simply taking the proffered payment – they cajole, inform, advise, persuade and so on. These activities are embedded in the cash collection encounter and are occasioned by the act of paying (or otherwise). In this case moving to mobile money removes the people from the collections, under the motive of enabling anytime, anywhere payments. However, cash is much more than a simple payment mechanism. The act of paying cash to a collector is a social encounter, embedded in social relationships forged over time. These social relationships create the conditions for payment; drivers are proud to be buying their own auto-rickshaw, grateful to TWU for helping them; they have a sense of social responsibility – wanting to appear to be good payers and responsible borrowers, as evidenced by drivers even going in person to let the collector know they would miss a payment, and to maintain their face in the community, which is why sending a collection team to their house in cases of repeated missed payment was effective.

Nonetheless, drivers need help managing their uncertain income, which goes beyond spreading payments from monthly to daily or weekly. Collectors therefore 1) make drivers accountable for payment, underpayment and non-payment, 2) provide on-the-fly loan counselling and advice, and 3) adapt payment schedules to drivers' circumstances. Much of this work is done at the point of collections, which no longer happen with Airtel Money. Whilst drivers paying with Airtel Money will still be held accountable for missed payment and underpayment, the immediacy of that account will be lost. Furthermore, much of the loan counselling work is done with drivers who are not yet in trouble. Without the close relationship of regular cash collection meetings, it is likely to be hard to identify such drivers in advance. Even with regular community meetings and such like, because the counselling is occasioned by the particular features of the cash collection encounter in which it takes place, it will be hard to recreate outside of this encounter. For example, in face-to-face community meetings the business will be community development, not the minutiae of drivers' loan payments. It should be noted however, that even

with cash collections, all this comes at a cost. It is dependent on the collector's ability, status and respect, on their skill at loan counselling, and like call centre work on their persuasive abilities (O'Neill, 2010). Despite this cash collections are clearly an important part of building and maintaining the relationship between TWU and the drivers.

5.2   The work to make mobile money work

In the previous section, we described how Airtel Money was made usable because of the wider socio-technical ecosystem in which it was embedded, and the consequences on the collaborative and organisational work of moving from face-to-face to remote payments. In this section, we continue our examination of the work to make mobile money work, by focusing on one of the key selling points of Airtel money in this setting – that it enables anytime, anywhere payments.

One of the advantages of many forms of digital money is that they promise to remove the physical constraint of 'being there' that comes with cash (Heyer and Mas, 2009; Jenkins, 2008). Airtel Money was sold to the auto-rickshaw drivers in this way, that they could make payments at their convenience, even whilst on the move, and the auto-rickshaw drivers certainly bought into this idea. However, whilst it is theoretically possible, practical constraints mean that this is rarely if ever experienced. This is because drivers limited and irregular daily cash income and tight financial circumstances mean they typically recharge their account and then make the payment for the full amount almost immediately. Recharging and paying therefore become one activity that remains time and place bound. This is reminiscent of studies of technologies promising anytime, anywhere work, whilst it may in theory be possible, the practical constraints of situated use mean it is rarely if ever experienced (Perry et al, 2001; Gupta et al, 2014; Matthiesen and Bjørn, 2016).

The convenience of Airtel Money, and therefore crucially its ability to support daily payments, was further reduced because of the difficulty of finding convenient recharge centres and some drivers were returning to cash because of this. Whilst the actual transaction of paying is relatively easy, at least, once training has been given, support is provided, and it is embedded in a wider trusted socio-technical ecosystem! To even get this far, drivers need to change their cash to digital money (and they need to do this *every time*). Our study demonstrates how the usability of Airtel (or indeed any mobile) Money is impacted by the joint and interrelated concerns of *infrastructure* and *interoperability* (of different money systems).

As described, the Airtel Money physical infrastructure is rather sparse. Whilst this may seem to be just an Airtel Money problem, no mobile money system in Bangalore provides a wealth of local payment places embedded within the driver communities. Except for a few well stocked migrant communities, mobile money in India seems to be stuck in something of a catch-22 situation, the mobile money

providers won't expand their network without demand, but how will demand be created without a network?

Turning to interoperability, whilst the cash economy in which the auto-drivers reside introduces extra constraints, it is not solely a cash to digital problem. Previous research in wealthier economies has shown that digital currencies do not necessarily have easy interoperability between them either (Mainwaring, March and Maurer, 2008). How money is exchanged between currencies, the conversion costs, how it is locked in and what it can be spent on are questions which apply as much to digital currencies as between cash and digital. Indeed a few of the drivers in our study used Ola auto (Ahmed et al, 2016) and a small proportion of their income was paid through Ola Wallet into a bank account, but the drivers did not have an easy way of transferring this into Airtel Money, even if they had wished to. All drivers simply withdrew the money as cash from the ATM. Again, parallels can be seen between our findings and those in highly digital economies, for example Mainwaring, March and Maurer (2008) paint a picture of an ecosystem of relatively isolated digital currencies in Japan. Thus, whilst topping-up or recharging digital currency is a problem and effort for auto-rickshaw drivers living in a low income primarily cash economy, this problem does not go away even with relatively good incomes and a digital economy.

Whilst research papers on the usability of mobile money systems in the lab dismiss such matters as out of scope (e.g. Balan et al, 2009), they are crucial for the usability of any mobile money system. We would argue that we cannot look at usability or HCI in-the-narrow when designing mobile payment systems, particularly where one seeks to bring about positive change in low income communities. The usability, and therefore transformational aspects, of any mobile money system cannot be easily separated from the wider payment ecosystem. It is the workflow and ecosystem around Airtel Money that makes it usable here and perhaps is one reason why the adoption of digital money in one situation does not necessarily lead to more widespread use. Drivers have not adopted digital money per se, but have adopted one particular payment technology for one particular workflow and, as detailed, even that was not as successful as hoped. This is important given the excitement around mobile money as a potential route for financial inclusion (Davidson and McCarty, 2011; Donovan, 2012; Morawczynski and Pickens, 2009; Gates Foundation, 2017).

We have revealed how adoption of a mobile money service was contingent and considerable work was needed to make it accessible. Furthermore, it was not necessarily the best solution for the most financially vulnerable drivers, who had the most to lose from the removal of face-to-face collections. If mobile money is to be successfully employed as a tool for financial inclusion, all this needs to be taken into account. Whilst mobile money systems such as M-PESA, have proved to be a good solution for remittances (e.g. Morawczynski and Pickens, 2009), moves to more widespread use should include a careful examination of what might be

inadvertently designed-out as payments become remote. It is clear that we cannot take a solely technical approach to financial inclusion, and just as for bank accounts (Morawczynski et al, 2010) access to mobile money services alone is not enough. We return to this below.

5.3   Beyond mobile money: accessible financial services

Our study revealed the considerable amount of work that goes into making formal financial products work for low income communities. In this case the product is loans and the focus is on enabling loan payment. This has implications beyond the scope of this study.

If we take a transactional approach to payment it might be easy to think that loan payment is best done digitally, remotely, to make it as fast and efficient as possible for all parties. Certainly, this has been the approach in the Global North – digitization reduces the costs of payment/collection and credit ratings are used to determine who is likely to pay. However, this paper has revealed how loan payment is a social activity deeply embedded in the day-to-day lives of the payers and the vagaries and unpredictability of their work. Whilst this may seem peculiar to this population, or other low income groups, especially day labourers in emerging economies, it is worth reflecting on the implications for the Global North. As default rates on loans and mortgages indicate, many people struggle to meet their loan payments. The digitization of the process puts the majority of the work of paying on the payee, and hides all the work they may be doing to achieve on-time loan payments. Furthermore, it removes the element of the personal from the loan relationship. In comparison, in our setting the collector shares the burden, forming a collaborative relationship with the payee and making loan payment an organisational issue. Whilst credit ratings might exclude at least some of the bad payers, they also penalise the most financially vulnerable citizens, who do not so much lack discipline but need additional support for managing their money, not to mention flexibility in times of trouble. Perhaps we should be thinking also of ways to reintroduce the social work - supporting payment, counselling and financial education – and to be a bit less deterministic about concepts such as good and bad payers, enabling vulnerable people to access such services, rather than just excluding them.

This research also highlights one of the problems of digitization. Non-digital workflows are typically flexible, whilst introducing technology requires some formalization of these workflows. Flexibility has been built into this ecosystem and we would argue it is necessary for it to function. Any technical support needs to enable this flexibility, but this is notoriously hard for digital systems to do. In this setting it is made even harder by the range of literacies (financial, print and technical) of not just the drivers but also the collectors. Whilst we can see opportunities to support both drivers and collectors, particularly around managing

loan payments and building financial capability, this will be a crucial challenge to address in future work.

6 To conclude

In this paper, we have described an ethnographic study of a loan payment workflow, which enabled us to directly compare how the payment mechanism, whether cash or Airtel Money, impacted on the organisation and its customers. We revealed the considerable work to make mobile money work and how although it is tempting to see payment as a simple transactional act, in reality it is not only imbued with social meanings, it is embedded in a wider socio-technical ecosystem. The consequences of this become apparent through the direct comparison of the different payment mechanisms. Rather than enabling anytime, anywhere payments, because of the constraints of infrastructure and interoperability, in this ecosystem mobile money payments remained time and place bound. Our study has also led us to question some of the more techno-centric visions of mobile money as a route to financial inclusion. Finally, by revealing the importance of social work and flexibility for loan payments in a low-income community in the Global South, this study has implications for financially vulnerable communities in the Global North, where the human elements of loan management have been designed-out through credit ratings and digitization.

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