

Chapter 39:

Circuit Board Money: an infrastructural perspective on digital payments

Handbook of the Anthropology of Technology

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‘Crypto Cash for Humans’

In October 2019, I was loitering in a corridor on one of the last days of the annual Ethereum Developers conference, DevCon5, in Osaka, Japan, a conference dedicated to discussing cryptocurrencies, blockchain, and digital payments. Saturated from days of dense talks and mingling, I was standing with fellow conference stragglers when a man approached us with a metal briefcase. Opening the case, he pulled out plastic satchels filled with money for us to examine. ‘CRYPTO CASH FOR HUMANS’, read an accompanying cardboard tag.

The money-like thing handed to me had the familiar shape of a banknote, was made of soft plastic, and very colourful. The next thing you notice is the tech-paraphernalia covering it: a chip in the bottom right corner, an entire side of golden strips looking like something from a circuit board, an area marked NFC, and small golden perforations, numerically labelled. The note itself was beautiful, the gold an attractive contrast to the deep blues and purples and replicated in the English and Chinese lettering. The note was marked ‘1 KONG’, and was illustrated with a peculiar rendition of the Roman god Mercury and, on the other side, an abstract planet with a triangular incision revealing its layers. It resembled something freshly materialised from a sci-fi novel.

Months later, when I showed the note to a dear colleague, she expressed surprise at finding the *digital* money firmly in her hand. Expecting a computer screen, the circuit-board-esque features of this crypto-cash were disrupting her expectations of what makes money, well, money.

Questions about what makes money work, what it is worth, and how it is used have long been studied within economic anthropology, although the emergence of its digital forms has

catalysed a recent discussion about the nature and origin of money itself (Maurer, 2012). Moreover, it has brought a renewed focus on the infrastructures of payments, as transactions are increasingly facilitated through payment terminals, credit cards, and apps. In recent years, scholars have shown how this digitalisation can also be understood as encouraging the privatisation of transactional records. As a result, growing critical scholarship is interrogating how increasing dependencies, but also new forms of inclusion and exclusion, occur when transactional infrastructures are owned by private payments companies, a distinct change from the public utility of cash (Dalinghaus, 2019).

In the first part of this handbook chapter, I begin by presenting literature from economic anthropology that leads to a conceptualisation of money as an infrastructure for keeping account of individual and societal debt relations. I choose this framing because it can be productive to think of digital money forms, not as digitised cash but as new technologies for accounting. Following this, I focus on the growing scholarship which attends to the subsequent infrastructural implications for everyday transactions, and finish with literature that examines how this digital transition has affected exchange relationships and led to growing intermediation and control through proprietary infrastructures.

In the second half of the chapter, I explore these dynamics through the empirical case of so-called *digital wallets* in Indonesia, addressing how the underlying infrastructure imposes conditions for exchange and configures users on either side of the exchange relationship. Finally, I conclude by discussing the relevance of ethnographic studies of digital payments and argue that an infrastructural perspective can draw attention to those details of value circulation and debt relationships that we might otherwise neglect in our day-to-day transactions.

Money, debt, and cashless transactions

The study of economies within anthropology dates as far back as the discipline itself, providing a wide range of contributions that describe and analyse economic life from an anthropological perspective (see Malinowski, 1922/2014; Mauss, 1925/2016). Today the field extends beyond special-purpose money in highly localised social contexts, to the abstract values traded rapidly on stock markets (see Ho, 2009; Zaloom, 2006) and even cryptocurrencies (see Brunton, 2019; Maurer, 2017). My interest here is in what Bill Maurer defines as the anthropology of money (see Maurer, 2006), which engages with the social meanings of money and its function in exchanges and value circulation. I am particularly interested in how money as a transactional technology is affected by digitalisation.

One of the early defining debates that characterised the field of economic anthropology was between the formalists and the substantivists. The former argued for the application of so-called universal mainstream economic market theory to the foreign settings that were now being explored by anthropologists (see Burling, 1962; Cook, 1966; Schneider, 1974). Meanwhile, the substantivists argued for the importance of more localised economic analysis, stemming from the context of its creation (see Bohannan & Bohannan, 1968; Polanyi, 1944/2001). Although this encouraged a more pluralistic approach, it was also criticised for reproducing a simplistic, reductive, and even romanticised understanding of people living in so-called ‘primitive economies’ (Hann & Hart, 2011).

The distinction between the two factions gradually faded, and arguments were made that perhaps there was merit to a middle-ground approach (see Cancian, 1966) in which one does not under- or over-interpret the importance of socialised conceptualisations of economic relations

(see Granovetter, 1985). This led to an increasing emphasis within economic anthropology on thinking about the economy in terms of embeddedness and performativity (see Callon, 1998), as well as in terms of social reproduction (see Gibson-Graham, 2006; Meillassoux, 1975/1981; Weiner, 1980). Importantly, money came to be treated as more than the object itself and seen as a reflection of social relationships. Thus, much of the ethnographic work on money has emphasised its social entanglements and the everyday economic lives of its users (see Dodd, 2014; Maurer, Musaraj, & Small, 2018; Zelizer, 1995).

Building on all of this, one of the most important contributions of economic anthropology has been the substantiation of the *credit theory* of money, which suggests that monetary systems derive from debit and credit relationships, as opposed to originating in barter, as claimed in mainstream economic teachings (Graeber, 2011). This also provides an important paradigm shift in the study of digital payments because it introduces the notion that money can be viewed as more than a material object, but also as an infrastructure: a social infrastructure which, like its asphalt road and PVC pipe counterparts, is concerned not with the production of things, but with their circulation, with constraining and directing flows (see Elyachar, 2010; Simone, 2015). Facilitating the flow of resources and making complex societal debt relations visible, even tangible, money can be considered both a thing, as well as a relation between things (Larkin, 2013). Thus, I turn now to literature engaging specifically with three core functions of money: as a store of value, medium of exchange, and unit of account (Maurer, 2006). These conceptualisations matter because they impact on how money is translated into a digital form.

The notion that money functions as a store of value may seem straightforward at first glance: a ten dollar bill will buy an equivalent value of products. Then again, how is that value determined, and what is value anyway? David Graeber worked to develop an anthropological

theory of value (Graeber, 2001, 2013) to get beyond the paradigms of orthodox economic theory in which value is simply conflated with price, in part by examining economic, political, social, and linguistic understandings of value. He points particularly to the work of Marilyn Strathern, who showed that objects are themselves valued because of how they make important social relationships visible. In her foundational essay on the qualified self, she writes, ‘what people exchange is always a totality: one perspective for another; your view of my assets for my view of yours. Thus are persons and objects created’ (Strathern, 1992, p. 188). Perceptions of value contribute to defining the world in terms of what might be considered important or desirable. Thus, the value of a money-object derives from its social context.

By contrast, the standardisation of value into money forms such as a symbolic metal coin firmly separates the money form from its socially constructed value. Reduced to a ‘wholly abstract token’ (Maurer, 2018, p. 8) value might be determined through monetary policy or market speculation. Jane I. Guyer (2012) shows the interconnectedness between what she calls ‘hard’ and ‘soft’ currencies. Hardness alludes to durability, meaning it can hold its form and later be liquidated into other forms, a quality well suited for something that should store value. By contrast, soft currencies might have fluctuating or rapidly depreciating value (or may literally deteriorate), making them more suited as mediums of exchange.

Standardised or not, the forms of money in circulation will typically comprise a plurality, and Guyer was particularly interested in those transactions that involved the exchange of things with seemingly unequal or incommensurable values. Her research in equatorial Africa thus drew attention to the subtle ways in which conversions of value take place, finding that people also operate with a plurality of value scales (Guyer, 2004). This challenged the idea that currencies evolve from multiple special-purpose forms of money to a singular all-purpose money form.

Instead, she posits that both store of value and exchange continue to happen across multiple currencies, while also emphasising the interconnectedness of these dominant features of money (Guyer, 2012, p. 2216).

Thus, the wholly abstract token is not a given evolutionary outcome. Nevertheless, this understanding continues to be prevalent in orthodox economic theory through the barter theory of money whereby money originated to facilitate the barter of disparate products, a mediator with so-called objective value. I may not need wool in exchange for my clay pots, but if we can agree on a standardised value in the form of a price, materialised in these coins, then we can exchange goods with them instead. Thus, money allegedly resolves situations where there does not exist what is known as the ‘double coincidence of wants’ (Graeber, 2011, p. 22).

In this evolutionary narrative, so-called ‘primitive’ forms of value, such as shells or beads, evolved through coins and paper forms to credit cards and cryptocurrencies. This detaches value from specific material affordances or social entanglements, and pays limited attention to where this objective value comes from. Pervasive and compelling as the narrative is, Graeber draws on decades of ethnographic research to point out that there is simply no evidence to support this origin myth. Thus, according to him, the premise itself is flawed, ‘no one ever traded arrowheads for slabs of meat. Economists simply ignored this information’ (Graeber, 2011, p. 29). In his extensive 5,000-year historical review of debt, Graeber points out that credit systems existed long before the invention of coinage, suggesting that the common perception is not only wrong, but also back to front: money is a materialisation of existing credit and debt relationships.

The *state theory* of money suggests that money emerged when governments began to issue currency, a form of ‘money-proper’ (see Ingham, 2000) in which the value of a token was

assured through state authority. Here, money is representative of the relationship between the citizen and the state or, as credit theorists would argue, a form of state-issued IOU, which has long since lost its connection to any tangible asset such as gold stored in a vault. This paradigm shift away from gold-backed currency was not without controversy, and many adherents of cryptocurrency still ascribe to what has been called a form of digital metallism, in which it is believed that money must have a form of intrinsic value, as perceived with gold, emerging separately from social relations (see Brunton, 2017; Swartz, 2018).

To conclude, I want to point out that cashless transactions are neither a novelty nor something exclusively associated with digital forms of money. For instance, Maurer cites research by Denise Schmandt-Besserat (1992) who identified tokens of account dating from 8000 and 3200 BCE. These devices allowed transactions to take place without exchanging any physical object, providing instead a record of transactions and obligations owed (Maurer, 2018). Thus, there is extensive scholarship that supports the credit theory of money and understands money as an instrument of accounting.

Payments, debris, and the metadata of digitalisation

An aspect of money that has been somewhat neglected in the literature, and which has gained renewed attention as a result of digitalisation, is that of the enabling mechanisms that allow those economic and financial transactions to happen: the underlying infrastructures of payment (Maurer, 2012). For the value in money to be exchangeable, it must be in an acceptable form and, especially when that form is digital, there is a role for intermediaries who can facilitate acceptance. Payments can also be said to be the infrastructure that allows money to move, by organising, legitimating, and materially facilitating transactions (Rea, Dalinghaus, Nelms, &

Maurer, 2016, p. 3). In this section, I present a selection of the scholarship that engages with the impacts of the digitalisation of payments, the enabling and underlying infrastructures, and the emergent meta-value of our transactions. I choose here to focus on the literature that provides a critical perspective onto how digitalisation may lead to privatisation and proprietary infrastructures as this is an often neglected aspect of digital payments and one that can benefit from ethnographic research.

In their edited volume, *Paid: Tales of Dongles, Checks and Other Money Stuff*, Maurer and Lana Swartz (2017) draw attention to what they call the ‘debris’ of cashless transactions—the multitude of payment artefacts allowing money transactions to take place—writing, ‘Like many critical infrastructures, most users only notice them when they are broken’ (Maurer & Swartz, 2017, p. xvii). What they point out is that much of this underlying payments infrastructure is rendered invisible by design through its *frictionless aesthetics*, which presents practical challenges for ethnographic research. After all, how do you observe or engage with transactional behaviour that takes place between a person and their fingers moving across a screen? How do you make visible exchanges when money is a numerical record in a remote database? The volume provides a great source of inspiration for ethnographic research into the material traces of cashless electronic payments, ranging from ATMs and receipts to hardware such as payment dongles, or physical gestures such as swiping.

Examining the material aspects of cashless transactions provides a contact point for studying digital payments but does not tell us what is being transferred instead of cash. At its core, digital payment is just banks requesting other banks to change their record of accounts through third-party infrastructural providers such as VISA or Mastercard. One could turn the phrase on its head and argue that a cashless society could more accurately be called a bank-

transfer society (Scott, 2017). As described earlier, rather than seeing digital money as a natural evolution of cash, it would thus be more accurate to think of the digitalisation of payments as the development of accounting technology. Thus, the ethnographic study of digital payments involves more than simply changed (or unchanged) economic practices, it challenges us to examine the political questions of where, how, and by whom that accounting takes place (see Swartz, 2020).

While money and digital payment networks have largely been the domain of governments, banks, and established corporate actors such as VISA, Rea et al. (2016) draw attention to a recent infrastructural shift. Over the past decade, mobile network operators and other *fintech* actors are leveraging the communications network infrastructure they have already developed, ‘attempting to use the networks they have built to carry another kind of data – financial data’ (Rea et al., 2016, p. 2). Often referred to as *peer-to-peer* (P2P) transactions, technologies like M-Pesa in Kenya allow users to transact, for example, by sending airtime intended for phone use to each other in place of cash, providing a cheaper, faster, and safer alternative to conventional cash or bank transfers. In their review of the literature from the past decade on *mobile money*, Rea and Nelms make some important observations about how the concept of P2P transactions has come to be a ‘fundamental transactional form’ (Rea & Nelms, 2017, p. 8). While P2P is commonly understood to be a directional description of how money flows (FROM peer TO peer), Rea and Nelms suggest that the 2 might instead be considered a placeholder for the intermediary facilitating the exchange (FROM peer THROUGH intermediary TO peer). In doing so, they point to an important avenue for ethnographic research, one centring not only on the users of this technology but also on those who create, implement, and control it.

Rachel O’Dwyer does just this when she asks us to consider emerging questions of sociotechnical control ‘when pipes become banks’ (O’Dwyer, 2015). She argues that the increasing role of ICT companies in providing critical infrastructure for payments will result in the algorithmic governance of transactions, as rules become automated and hardcoded into the platforms and systems themselves. Where law traditionally relies on interpretation and the flexibility of a case-by-case basis for arbitration, algorithmic governance rigidly controls the actions of its users as determined, critically, by the intermediaries providing the software. O’Dwyer paraphrases Donald Mackenzie (2008) to say that ‘algorithms are “engines not cameras”’ (O’Dwyer, 2015, p. 3), pointing to how these apps do not simply model existing transactional patterns; rather, they play a significant role in configuring users and determining what money is, who it belongs to, and how it circulates.

Alluding to this algorithmic configuration of users, Keith Hart described back in 1986 how the digitalisation of money also results in the digitalisation of our personal identities. Specifically, merging our money with our transaction history and leaving computers to assess our creditworthiness risks reducing people to ‘a formal abstraction of individual human beings, to a cipher in a universe of numbers.’ (Hart, 1986, p. 642). Or, as O’Dwyer formulates it three decades later, ‘In virtualising money, non-cash payments materialize previously latent informational traces of who transferred money to whom and in exchange for what’ (O’Dwyer, 2015, p. 5). For Hart, money could be conceptualised as a form of collective memory—a technology for keeping track of our extended societal debt relationships. The money tokens in my pocket, the receipts in my wallet, and the numbers on my monthly bills, all ‘constitute a way of summarizing relationships with society at a given time’ (Hart, 2007, p. 16). Where cash itself is anonymous, usable by whoever is holding it, digital money becomes hyper-personalised.

Digitalisation does not just move this infrastructure from our wallets to digital databases; it has facilitated an unprecedented aggregation and personalisation of *transactional metadata*. Referencing the digital storage of data, O’Dwyer describes this as producing a *cache society* in which the memory traces of our extended social relationships form a novel type of value for the intermediaries of our transactions (O’Dwyer, 2018). For intermediaries, the value in providing payments infrastructure shifted from imposing fees or rents to the value of the transactional metadata itself. Thus, for the intermediaries ‘the dream is for a system where value enters a network and circulates endlessly, never leaving as material cash.’ (Maurer, 2016, p. 214). As Brett Scott points out, not only is the cache society a valuable business model for the companies controlling the infrastructure, this system of bank-based transactions also ‘forms a panopticon that enables—in theory—all transactions to be recorded, watched and analysed, good or bad’ (Scott, 2017). The concern at the heart of this argument lies in both the increasing privatisation of monetary systems and the increasing power of its proprietors: centralised institutions verifying transactions through private databases.

Financial in/exclusion in a digital economy

The increasing prominence of digital payments thus calls for more analytical study of the intermediation and infrastructural control involved in the digital economy. Here, ethnography has a particularly important perspective to offer, in its ability to demonstrate the visceral experience and conditions of being participants in such an economy. Recently, there has been more concentrated attention in the literature on the global push from both industry and governments towards becoming cashless societies, even to the point of demonetisation as seen in India (Peebles, 2020). We see in the literature how arguments about *financial inclusion* are mobilised to justify the transition (see Sen, Lindquist, & Kolling, 2020), but also how there has

been a paradigm shift in the industry. Where earlier emphasis may have been on financial aid, financial inclusion recasts those who are poor, unbanked, or socio-economically marginalised as a new and untapped market (Elyachar, 2012). The literature in this section thus focuses on digital payments in the context of financial inclusion and asks who the imagined participants of this cashless future are, and how they might experience this digitalisation.

Digital payments in the form of mobile money came to be a central component in the financial inclusion and poverty reduction agenda because more people are understood to have access to phones than to bank accounts (see Burrell, 2018; Rea & Nelms, 2017). Thus far, much of the literature on mobile money and financial inclusion has been produced by development professionals who, according to Sibel Kusimba (2018), make assumptions about the financial needs of the poor that they seek to help. In contrast, Kusimba's research shows how communities in Western Kenya leverage digital forms of money to mobilise other money forms within the context of socially important life-cycle rituals. Mobile money did not fundamentally change the purposes of economic practices; rather, it became incorporated within existing hierarchies of value formed by the specific socio-economic context.

While mobile payments may indeed make certain services more affordable, safe, or cheap, engaging people currently existing outside formal systems is arguably also a strategy for converting a large number of people into customers. Deborah James, in her work on debt in South Africa, refers to this process as a deepening of the financial sector (James, 2015). Julia Elyachar points to how private industry and fintech actors within the so-called 'payments space' actually benefit from 'uncovering, developing, and mobilizing existing forms of infrastructure created by the bottom of the pyramid, the world's poorest, and building on them to create new kinds of financial and information services for a profit' (Elyachar, 2010, p. 458). The leveraging

of this social infrastructure by corporate actors takes place under the guise of *economic empowerment*, in which access to financial services is seen as a mechanism for reducing poverty.

There are also examples of private retailers offering access to personal financing in the form of credit cards in contexts where people do not have bank accounts; empirical cases show how such credit cards and their associated debts circulate between people in a new form of financial practice in which the access to credit can be shared (see Kolling, 2020; Ossandón, Ariztía, Barros, & Peralta, 2018). However, such measures to ‘include’ people in formal financial structures, particularly through cashless payments, can also lead to increased vulnerability and financial instability. This is due the increasing social entanglements in which people become both debtors and creditors, as Marie Kolling demonstrates in her empirical work in Brazil, but also because digital financial infrastructures quickly come to dominate the socio-economic context, making it difficult to opt out. Writing about the rapid introduction of digital financial inclusion initiatives in China, Nicholas Loubere observes that ‘integration into the formal financial and economic systems is not really voluntary’ (Loubere, 2017, p. 17). Instead, he argues, these initiatives may lead to destructive outcomes, and reproduce existing inequalities and exploitative relations.

While some people are forcefully included, others encounter new forms of exclusion (see Donovan, 2018; Roy, 2010, 2018). Camilla Ida Ravnbøll describes how the introduction of cashlessness at music festivals in Denmark impacts upon the Roma who depend upon income from bottle collection, forcing them to adapt and change working strategies. She makes the critical point, that ‘digital payments are not only about technology but also about defining social relations and hierarchical positions’ (Ravnbøl, 2020, pp. 16–17). Indeed, when first introduced, credit cards also alluded to a form of aspirational modernity in the form of a cashless society.

However, Lana Swartz points out that participation in that modernity remained heavily socially regulated, and Black Americans in particular were likely to have their cards declined as a form of payment, even when the technical infrastructure was in place. The Diner's Club credit card 'could only provide a privatised version of modernity that reflected and reinforced existing social difference' (Swartz, 2017, p. 86). Notably, ethnographic research here can show us how those who are precluded from access are excluded not only from particular payment infrastructures but also from the vision of the modern society that cashlessness represents.

Digital 'wallets' in Indonesia – peers and intermediaries

I turn now to my research on digital wallets in Yogyakarta, Indonesia. Similar to the contexts described above, statistically it is more common for Indonesian people to have access to a mobile phone than it is to have access to a bank account, and only a minority have access to debit or credit cards which would allow them to make digital payments (Azali, 2016). Although e-commerce has long been booming, many payments still take place in the form of cash-on-delivery services, or through payment codes, which can be activated at an ATM or minimarket within a given timeframe, and then paid with cash (Pangestu & Dewi, 2017). In the past five years, and particularly since 2017, there has been a rapid uptake of app-based digital wallets allowing users to convert cash and store it in a digital form on their smartphones.

I will focus on two main examples of such wallets, namely Go-Pay and OVO.¹ Go-Pay is the wallet situated within an app called Gojek. Famously Indonesia's first tech unicorn, Gojek started as a ride-hailing app by formalising contact with existing *ojek* drivers who provided motorcycle-taxi services, but now includes a wide range of services ranging from Go-Massage to Go-Food (Nastiti, 2017). OVO is a stand-alone wallet app but also collaborates with various e-

commerce platforms to provide an integrated digital payment mechanism. One such platform is Grab, a Singaporean company that also provides ride-hailing services in Indonesia. As transport is a critical service for many people, the self-described *online drivers* using these platforms often become the first point of contact with these novel digital wallets. The extensive fleet of drivers can act as exchange agents and the companies provide financial incentives encouraging them to sell their own digital balance to customers in exchange for cash. This indicates that the apps are interested in more customers using the digital payments infrastructure, rather than their using cash to pay for trips booked in the app.

It is important to understand that once a customer's money has entered the system and been converted into digital credit, it cannot easily be extracted again except by spending it. Extracting it would require either that the user connect their app to a bank account, or that they upgrade their account using formal ID, thus unlocking additional features. The denomination indicated in the app may be in rupiah (IDR) but, in effect, it functions as a company-specific token that can only be used as payment within the designated app ecosystem of services, thus keeping as many transactions as possible within the system. Both OVO and Go-Pay can be described as peer-to-peer (P2P) payments to the extent that they allow users to connect and exchange value using an intermediary platform (Ford & Honan, 2017). During the first weeks of my fieldwork in 2018, I assumed that drivers and passengers shared, if not the same, then at least a similar digital wallet infrastructure. After all, from my perspective, I was making digital payments with my Go-Pay wallet to their Go-Pay wallet. In an early interview, I came to realise that this was not the case, as a Grab driver walked me through the app as seen from his perspective. This became the starting point for investigating how the app was configuring our interactions through the platform.

When it comes to wallets, drivers have two, neither of which is the same as my Go-Pay wallet.² Instead, they have a ‘cash’ as well as a ‘credit’ wallet. When booking a trip through the app, the customer chooses whether to make the payment digitally or with cash. Notably, if the customer selects a digital payment, the app offers them a 20 per cent discount on the trip. Digital payments accrue in a driver’s ‘cash’ wallet throughout the day, and can eventually be moved to a connected bank account, to be extracted as cash at an ATM. In the case of cash payment, the customer pays the full price, handing it to the driver at the end of the trip. The driver will earn the same 80 per cent of the fare because the company now extracts a 20 per cent cut from the ‘credit’ wallet, which the driver keeps ‘topped-up’ for this purpose throughout the day. Thus, the company not only forgoes their cut in the case of digital payment, but they also offer it as a price reduction to the customer. Once again, it is evident that the company has an interest in increasing the number of digital transactions, indicating that the real value of this P2P exchange is in the transactional metadata rather than the fees earned on the transactions themselves.

It is important to note that P2P was originally a technical term used to describe a technological infrastructure where two computer systems connect and share files *without* requiring a central server. With the growing fintech industry, the term has come to be used to describe a wide range of economic exchanges ranging from remittances to microfinance, from blockchain to digital wallets in Indonesia. Not only does the term ‘peer’ have specific social connotations associated with socio-economic equality, but most of the contexts described above also, in fact, require a central intermediary to facilitate the transaction. This raises questions about what it means to be a peer in these contexts, and how the intermediary companies governing the platforms are configuring this alleged peerhood.

Let me describe a Gojek advertisement released in 2016.³ A young girl is asking her mother if she will be home in time to break the fast for Ramadan that evening. Donning her distinctive green Gojek helmet, the mother gives the girl a small package, telling her to open it when she breaks the fast. We see multiple clips of the mother driving passengers to and fro. It is hot, she is tired, and all these customers are cranky and rude. Her final passenger is taking food to an orphanage for Ramadan, and as she watches all the happy children, the mother smiles despite everything. Meanwhile, her daughter opens the gift, a box of dates, alone. It contains a card from her mother, apologising because they cannot be together, and explaining that mom needs to make sure everyone else gets home in time to celebrate. Finally, alone on her scooter and having her first drink of water, the mother receives several messages, as customers send grateful thanks and positive ratings through the app.

Firstly, this advertisement presents the imagined participants in the exchange: the service provider and the service user. Secondly, besides the green helmet, the company itself is hardly present: their role as an intermediary of the exchange only becomes apparent towards the end, when the phone makes its first appearance. The advertisement emphasises that the users are social equals who are helping each other out in an important cultural and religious event. What it does not emphasise is the precarity of the seemingly single mother, who cannot be home since she must work long hours. Instead, it almost seems as if she is doing this work out of a sense of social responsibility towards her peers. Notably, money is never seen nor mentioned.

Interfaces, incentives, and a system that ‘doesn’t wanna know’

While we can view such advertisements as analytical clues, the apps themselves present relatively closed digital environments. As they come to dominate important social infrastructures

such as storage and transaction of money, they present new challenges for ethnographic researchers, and it is important to develop ways to navigate their specific research affordances (Dieter et al., 2018). Light, Burgess, and Duguay (2018) suggest that by analysing the mechanisms, affordances, and culturally embedded references within the interfaces of an app, it is possible to interrogate its invisible infrastructures (see also Star, 1999). During my fieldwork, informants would invariably turn to the app to illustrate their points, and I too found myself recording thousands of screenshots as a way of documenting my encounters. It drew my attention to the specific dynamics that the app imposed between the service provider and service user, the supposed peers of the exchange.

One such example was the built-in, one-way rating mechanism. Passengers score drivers on a scale from 1 to 5 stars. As a passenger poises to swipe, the distance between one or five stars is a matter of millimetres, but for a driver, it could mean suspension or permanent exclusion. The consequence is that passengers wield significant power over the drivers and can demand detours or additional services. The drivers I spoke with felt obliged to appease their customers out of fear of a negative rating. For drivers, features such as pre-defined routes and trip price, the seconds within which to decide to accept an order, and the serious repercussions of cancelling, all made it clear who was the real customer from the perspective of the company. The conditions for drivers are hardly transparent. For instance, in the passenger interface during a top-up transaction, it is possible to see the balance in the driver's account before requesting an exchange. What I, the passenger, cannot see, is that the driver does not have the option to decline the request: in effect, losing control of their digital balance while also relying on customers to honour the exchange by handing over the equivalent in cash money.

On March 8, 2019, the Gojek car drivers in Yogyakarta went on strike in response to the introduction of a new system for earning ‘bonuses’ (Lufityanti, 2019; Susmayanti, 2019). The bonus system allows drivers to accumulate points for completed trips with the points accumulating towards three target tiers. Reaching each tier results in the driver earning a ‘cash’ bonus, which appears in their ‘cash’ wallet after midnight, and which comprises a significant proportion of their daily income. For many whom I spoke to, it is the ‘bonus’, that makes the work financially viable. In answer to my questions about daily working hours, drivers would tell me that they went home when they were able to *tupo*, short for *tutup poin*, or ‘closing the points’. As one driver explained, if you cannot close the points, then the money disappears at midnight, when the system resets. The change that the drivers were protesting was the sudden introduction of four different tier systems, known as *skema*. Without knowing why, some drivers found themselves with tiers that capped at half the number of points compared to others. Furthermore, the value of the bonuses for the highest tier now differed significantly from *skema* to *skema*. In practice, it meant that a driver with the worst *skema* could never earn as much as a driver with the best one, even if completing as many rides. The drivers shared many theories with me as to what determined which *skema* you would get, but a rough consensus seemed to indicate that the determining factor was how many trips a driver had completed in the past two weeks. Thus, the effect of not working for any period of time compounds, potentially reducing income for weeks afterwards.

Drivers also experienced inequalities in regard to which accounts were able to receive customer orders, distinguishing between accounts that are *gagu*, muted, and accounts that are *gacor*, short for *gampang cari orderan*, describing a state in which it is easy to find orders. One informant described calling Gojek customer service after spending several hours without a single

order, only to be told that his account was active and that the system was working fine. ‘*Sistem ngak mau tahu!*’ drivers would frequently exclaim to me, ‘the system doesn’t wanna know’. In practice, where a driver’s account falls on the scale of *gagu* to *gacor* is likely governed algorithmically, and drivers described multiple practices they would deploy to make sure their accounts ranked highly for order distribution.

In practice, drivers could be doing the same amount of work, in term of hours spent online and available to receive orders, and never have equal income opportunities. Not only does promotion of the notion of peerhood conceal embedded inequalities between the ‘peers’ on either side of the P2P acronym, it also does not convey the extent to which inequalities are induced and exacerbated within each ‘peer group’. It also obfuscates the role of the intermediary in defining the terms of the relationship and how value is determined and circulated.

Conclusion

In this chapter, I have explored how anthropological conceptualisations of money as a social infrastructure for keeping account of debt relations can inform our study of digital payments by positioning digital forms of money as developments of accounting technology rather than evolutions on cash. With this conceptualisation, it becomes possible to draw ethnographic attention to the infrastructures that enable digital transactions to take place. Through my case study of digital wallets in Indonesia, I have examined how such infrastructures affect transactional behaviour and the social relations of those engaging through them. As economic transactions become increasingly screen-based, digital payments pose particular challenges for ethnographers. When the interaction is mediated through interfaces in an app or on a computer screen, it can be difficult to observe the subtle details that impact upon

transactional decision making. Furthermore, central digital mechanisms that now govern the economic lives of respondents may change from one day to the next. As the infrastructure governing transactions can change with every update, this is a topic of study that feels like a perpetually moving and intangible target. Thus, as Lana Swartz and Bill Maurer (2017) encourage, we need to dig deeper to uncover the material traces of digital payments and examine the spaces in which the digital materialises.

To convey what is at stake in the digitalisation of payments Brett Scott draws comparisons with the process of neighbourhood gentrification by wealthier population groups and corporate actors. Cash as a public, state-issued infrastructure is associated with a poorer population, often operating without receipts. ‘Digital payment, however, is the domain of large-scale globalised financial corporations, and cannot be separated from them or taken out of their view. To use—or to be forced to use—digital payments is to enter their sphere of influence and power’ (Scott, 2019). As with neighbourhoods, this gentrification can lead to dispossession, particularly for those depending on cash to make a living. While the value represented by cash can change owner when cash changes hands, making a digital payment is to request that an intermediary change their record of accounts. Thus, taking an infrastructural perspective to digital payments foregrounds political questions of control: control of the accounts, but also of the terms for the circulation of value itself. It draws attention to the power that private actors hold in organising proprietary infrastructure to enable novel forms of wealth extraction, converting the user not just into a consumer but also into a commodity by monetising transactional metadata.

Here, ethnographic methods provide an access point through which we can examine aspects of this circulation of digital value and draw attention to the practical experiences of

people living in the digital economy; whether they experience new forms of transactional hierarchy, of financial practice, or forms of exclusion or dispossession. It can explore how industry terminology obscures and obfuscates the power dynamics encoded in the payments infrastructure. In my case study, formerly self-organised *ojek* are gradually being pressured to participate in the platform economy, where they are mobilised as financially incentivised agents who bring even more people into this privatised digital credit system.

However, an ethnographic approach can also help us to look beyond the infrastructure itself to give us detailed and nuanced accounts of how people navigate the seemingly rigid technological parameters imposed with proprietary infrastructure: repurposing and appropriating systems beyond uses that its developers might have imagined. The online drivers of Yogyakarta deploy a variety of practices to navigate the infrastructure and use its affordances against itself—conspiring with customers, taking trips offline to avoid the company cut, making ‘fake orders’ to earn their daily points, and using third-party software to obscure their GPS data from the prying eyes of the platforms—thus enacting peerhood in ways that were simultaneously catalysed by the presence of the specific infrastructure, but which also subverted and rejected the premises posed by it.

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Endnotes

¹ <https://www.gojek.com/gopay/> and <https://www.ovo.id/> respectively.

² Both apps have since incorporated a third commercial wallet for drivers, allowing them to move their earnings directly into the wallet they would use as customers.

³ Viewable at: https://www.youtube.com/watch?v=_u_OHKHSq8s